

BBC ACORN

USER



EDUCATION
what role for
computers in the
classroom of the nineties?



ARC UTILITIES
creating custom
display modes
and reading Beeb discs



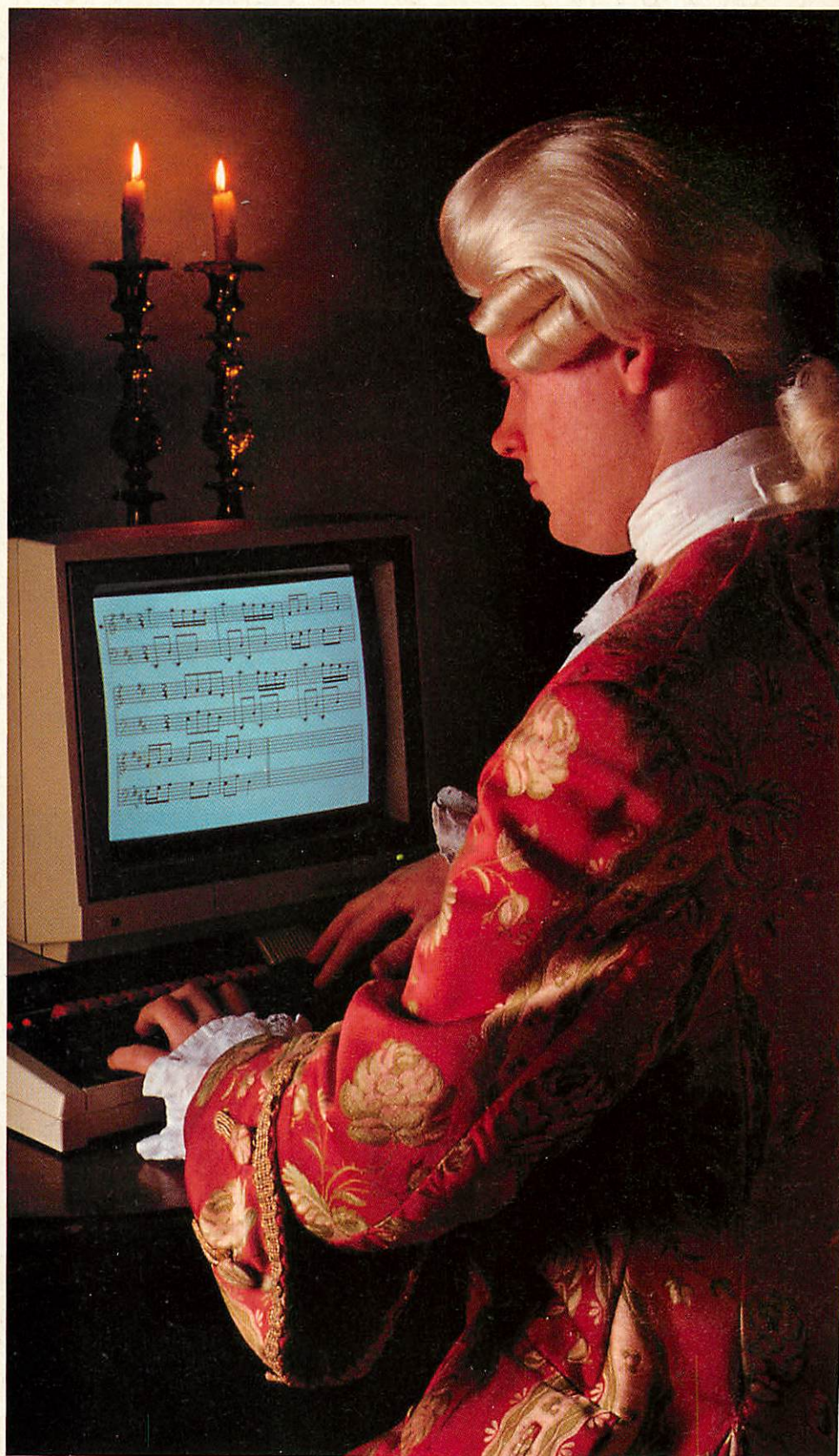
NEW PLACES
get more precision
in your arithmetic
on the Beeb and Master



REVIEWS
Arc DTP, discs,
hypermedia, Beeb
music, expansion, games

MICRO MAESTRO

music composition
on the Beeb



**SPECIAL OFFER
PRICE**
See below for details

HOW TO IMPROVE YOUR IMAGE

i-SCAN is the only scanner which has been specifically designed for the Archimedes. Future expansion capabilities for higher resolution and colour are already designed into the system.

i-SCAN consists of a scanning unit, expansion card, leads and software. The scanning unit has a precision motor driven paper transport mechanism which is more accurate than hand held scanners. i-SCAN can handle documents from postage stamp size up to A4 width. A full A4 page can be scanned in less than 20 seconds.

Other Archimedes scanners only produce monochrome images which are processed to produce a grey scale effect. i-SCAN images have 16 true grey levels and a resolution of 200 dots per inch (dpi), this is effectively equivalent to 800 dpi monochrome.

Software supplied with the package is completely Risc OS compatible. The scanned area is selectable to minimise memory used and subsequent editing. A window displays the scanned image where it can be enlarged or reduced. Programmable contrast adjustment caters for difficult images such as pencil drawings.

Images are saved as sprite files which can be used with !DTP, !Paint, !Draw and any other Risc OS application. Industry standard TIFF compressed files will soon be supported.



This image was scanned by i-SCAN



i-SCAN is supplied complete with expansion card, leads and software. All items carry a full one year guarantee.

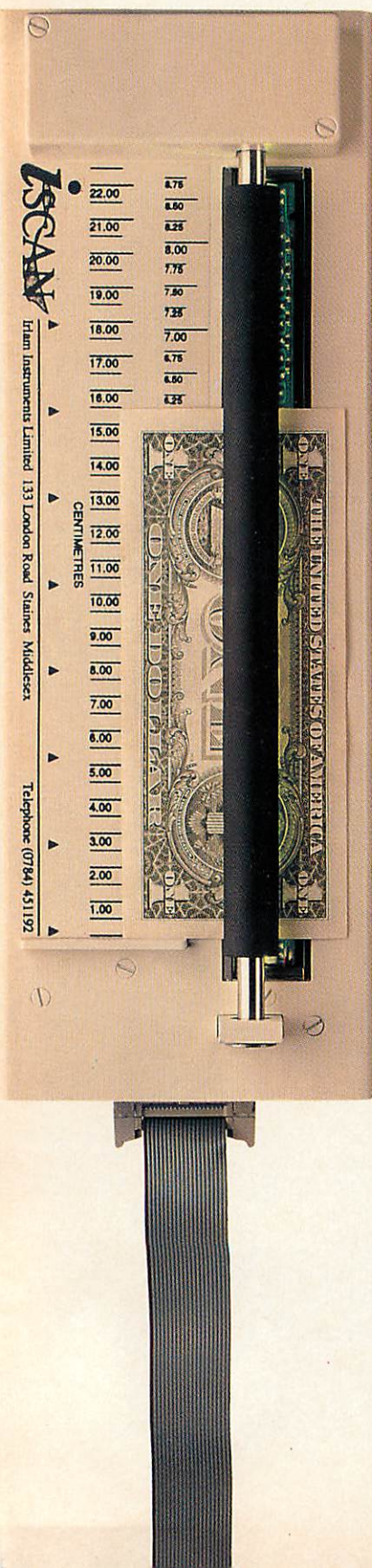
For a limited period i-SCAN will be available for £579 plus VAT (usual price £679). Desktop publishing software is available at a special offer price when purchased with i-SCAN.

Please telephone Staines (0784) 451192 for more information.

i-SCAN is manufactured by Irlam Instruments Limited, 133 London Road, Staines, Middlesex TW18 4HN.

iSCAN

Archimedes is a registered trademark of Acorn Computers.



OVERSEAS MEDIA DISTRIBUTORS LTD

OM HOUSE, 139-141 DOMINION ROAD, GLENFIELD, LEICESTER LE3 8JB

TEL: [0533] 877733 FAX: [0533] 873999

PRICES INC. VAT & DELIVERY



OVERSEAS MEDIA DISTRIBUTORS LTD

MINIMUM ORDER VALUE £12.50

OMD DISKS

• TOP QUALITY • CERTIFIED • GUARANTEED • 100% ERROR FREE • LABELS SUPPLIED

	Ref.	25	50	100	200
3 1/2" DSDD 135TPI	D6010	£19.50	£33.50	£59.50	£115.00
3 1/2" DSHD 1.44MB	D6011	£48.50	£89.00	£175.00	£325.00
5 1/4" DSDD 40/48T	D6020	—	£21.90	£39.50	£72.50
5 1/4" DSDD 80/96T	D6022	—	£24.50	£45.50	£85.00
5 1/4" DSHD 1.2MB	D6021	—	£42.50	£80.00	£155.00
5 1/4" COLOURED	D6120	—	£26.50	£49.00	£92.00

GET £2.50 OFF any other product when you order OMD DISKS

BRANDED DISKS

SONY 3M Dysan Verbatim

3 1/2" DSDD 135T	£13.90	QUANTITY DISCOUNTS
3 1/2" DSHD 1.44MB	£29.50	3 BOXES £3.00 OFF
5 1/4" DSDD 40/48T	£8.50	5 BOXES £10.00 OFF
5 1/4" DSHD 1.2MB	£13.90	10 BOXES £30.00 OFF

EXTERNAL DISK DRIVES

ARCHIMEDES

3 1/2" 80 TRACK	Ref. X1140	£159.00
5 1/4" 40/80 TRACK	Ref. X1141	£183.00

All with internal PSU, buffered interface, cable and rear panel.

BBC COMPATIBLE FLOPPY DRIVES AVAILABLE. PLEASE CALL FOR DETAILS.

PRINTERS

CITIZEN	Ref.		STAR	Ref.	
120D	H0100	£149	LC10	H0000	£169
SWIFT 24	H0101	£320	LC10 (Colour)	H0001	£219
PRODOT 9	H0102	£399	LC24-10	H0002	£269
HQP 40 (Colour)	H0103	£265	FR10	H0003	£370
PANASONIC			NEC		
KXP 1081	H0200	£165	P2t	H0300	£325
KXP 1180	H0201	£185	P6t	H0301	£508
KXP 1124	H0202	£265	P7t	H0302	£665

FREE BOX OF PAPER & CABLE WORTH £23.80

MANUAL DATA SWITCHES

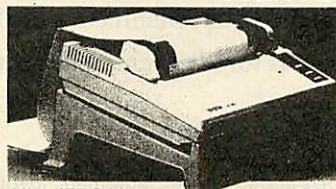
• LONG LIFE ROTARY SWITCH MECHANISM • NO POWER REQUIRED • FULL SHIELDING • ALL LINES ARE CONNECTED • FEMALE CONNECTORS

	Ref.	36pin	Ref.	25pin
2 way	X0001	£17.50	X0011	£16.50
4 way	X0003	£22.50	X0013	£21.50
X way	X0004	£24.50	X0014	£23.50

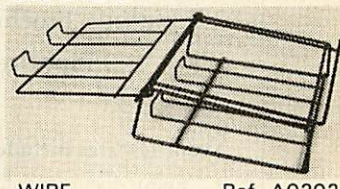
AUTOMATIC PRINTER SHARERS

	Ref.	Parallel	Ref.	Serial
2 computers/1 printer	X0101	£45.00	X0111	£47.00
4 computers/1 printer	X0102	£75.00	X0112	£77.00
8 computers/1 printer	X0103	£95.00	X0113	£97.00
2 computers/2 printers	X0150	£115.00	X0160	£125.00
4 computers/2 printers	X0151	£140.00	X0160	£150.00

PRINTER STANDS



UNIVERSAL Ref. A0201
Securely holds any printers wide or small.
Made of moulded plastic. **£10.50**



WIRE Ref. A0202
Made of safety plastic coated steel wire **£12.50**



SPACE SAVER
Made of moulded plastic.
Feeds and refolds paper underneath the printer.
Takes up hardly more space than the printer itself.
YUS-25A for 80 col. printer. Ref. A0203 **£27.90**
YUS-25B for 130 col. printer. Ref. A0204 **£32.50**



MOBILE
Rugged steel frame.
Height adjustable basket for output paper & base shelf for input paper.
Self assembly - includes castors.
80 COL Ref. A0205 **£65.00**
132 COL Ref. A0206 **£79.00**

DUST COVERS

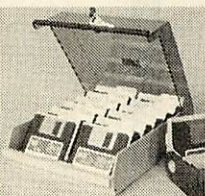
IBM PC XT/COMP	2PC	C0110	£9.50	Amstrad PCW 9512	2PC	C0104	£9.50
IBM PX AT/COMP	2PC	C0109	£10.50	Amiga A500	1PC	C0102	£5.50
IBM PS/2	2PC	C0111	£10.50	Atari 1040 STFM	1PC	C0108	£5.50
Amstrad PC 1640/1512	2PC	C0107	£10.50	Printers 80 Col*	1PC		£4.50
Amstrad PC 2086	2PC	C0106	£10.50	Printers 132 Col*	1pc		£5.50
Amstrad PC W8256	3PC	C0103	£13.50				

*Please specify printer

DISK

STORAGE SYSTEMS

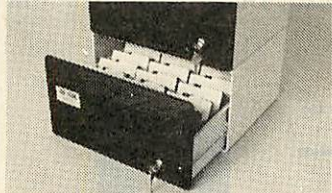
- AVAILABLE FOR 3 1/2" OR 5 1/4"
- LOCKABLE
- ANTI-STATIC
- SMOKED LID



50 CAP **£7.90**
100 CAP **£9.90** 120 CAP **£10.90**

STACKABLE

STORAGE SYSTEMS £24.50



150 CAP. 3 1/2" Ref. A0084
180 CAP. 5 1/4" Ref. A0194

COMPATIBLE

PRINTER RIBBONS

AMSTRAD 8256	R7410	£3.90
AMSTRAD DMP2000/3160	R4820	£2.75
AMSTRAD DMP4000	R4260	£4.50
CANON PW1080	R2230	£4.25
CITIZEN 120D	R4880	£4.25
EPSON LQ800	R4370	£3.90
EPSON LX 80/56	R4540	£2.90
EPSON MX/FX/RX80/FX/LX800	R2730	£2.90
NEC P2200	R8440	£4.50
PANASONIC KXP1081	R2280	£4.50
PANASONIC KXP1124	R9040	£4.90
SHINWA CP80	R6981	£4.50
STAR NL10	R7610	£3.90
STAR LC10	R8610	£3.90
STAR LC10 (Colour)	R8696	£7.90
STAR LC24-10	R8680	£4.50

BUY 10 GET 1 FREE

MANY OTHERS AVAILABLE - PLEASE CALL

ACCOUSTIC HOODS

- REDUCES PRINTER NOISE
- QUALITY MADE HOODS
- 12 MONTHS GUARANTEE

7 DAY FREE TRIAL AVAILABLE



PRICES FROM **£128.00**
PLEASE CALL FOR DETAILS

MATCHING PRINTER STAND **£99.00**

COMPUTER PAPER

11x9 1/2" 60GSM
Ref. P0101 Box of 2000 **£15.90**
PERFECT A4 85GSM
Ref. P0301 Box of 1000 **£13.90**

COMPUTER LABELS

• SELF ADHESIVE • TRACTOR FED
Packed 2000 3 1/2" x 17/16" **£11.90**
1, 2 or 3 across 4" x 17/16" **£12.90**

INTELLIGENT PRINTER BUFFERS

• BUFFER RAM STATUS INDICATOR • BUILT IN COMMANDS: COPY, FORMFEED & PAUSE

PARALLEL	Ref.	64K	Ref.	128K	Ref.	256K	Ref.	512K
1 input/1 output	X0210	£125	X0220	£160	X0230	£195	X0240	£275
3 input/1 output	X0211	£160	X0221	£195	X0231	£215	X0241	£295

All parallel buffers have 36 pin female connectors as standard

PRINTER CONTROL CENTRE

• SOFTWARE DRIVEN • KEYBOARD CONTROL

	Ref.	256K	Ref.	512K	Ref.	1MB
2 INPUTS/2 OUTPUTS	X0300	£285	X0302	£425	X0304	£730
4 INPUTS/2 OUTPUTS	X0301	£320	X0303	£455	X0305	£760

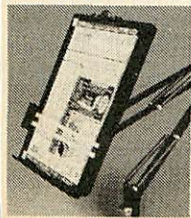
CABLES

PARALLEL 25 PIN/36 PIN	Ref. A0801	£7.50
25 PIN MALE/25 PIN MALE	A0804	£8.50
25 PIN MALE/25 PIN FEMALE	A0805	£8.50
36 PIN MALE/36 PIN MALE	A0806	£8.50

KEYBOARDS

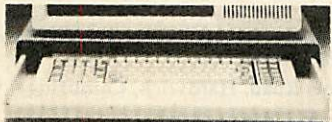
HIGH QUALITY 101 KEYS
TACTILE "CLICK" KEY SWITCHES
REF: X100 ENHANCED FOR AMSTRAD 1512/1640 **£72.50**
REF: X1001 REPLACEMENT FOR IBM XT/AT (OR COMPATIBLE) **£55.00**

COPY HOLDERS



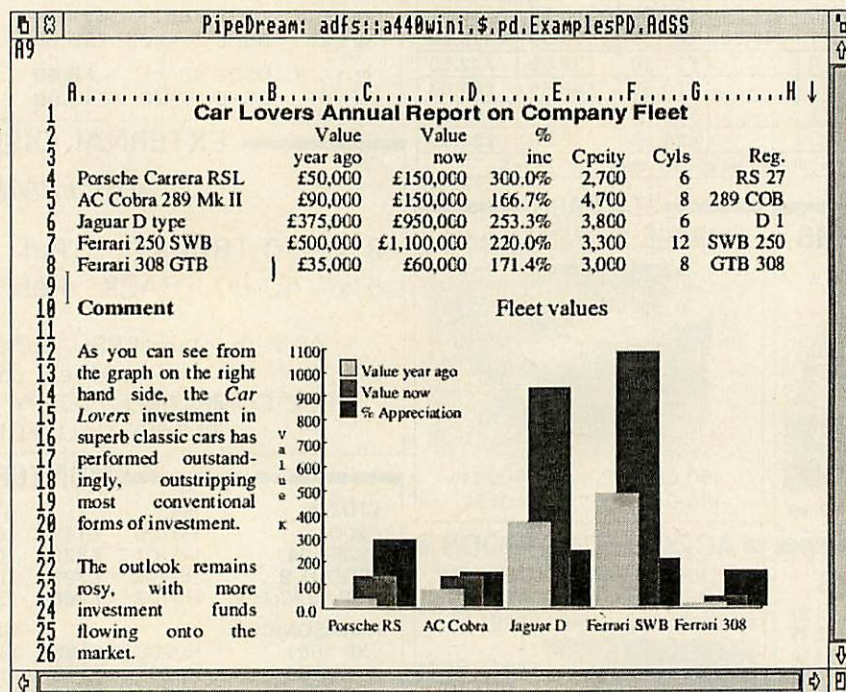
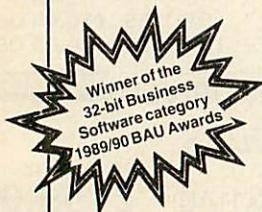
Desk Top Ref. A0301 **£7.90**
With adjustable arm
80 Column Ref. A0302 **£13.50**
132 Column Ref. A0303 **£19.50**

KEYBOARD DRAWER



Stores keyboard under the CPU or monitor safely out of the way of dust and dirt.
Ref: A0501 **£29.50**

PIPEDREAM 3



PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

Based on PipeDream 2, the best-selling integrated package for the Archimedes, PipeDream 3 has been completely re-written to take full advantage of RISC OS - if you can use RISC OS, you can use PipeDream 3. It is fully multi-tasking and multi-windowing, so you can work on many documents at once and instantly move information between them. And since PipeDream 3 can automatically load and save most popular file formats, including VIEW and First Word Plus, switching to it from other programs has never been easier.

Power, flexibility, speed, ease of use. PipeDream 3. Breaking down the barriers.

For a free brochure, see your Archimedes dealer, or phone us on 0954 211472 or return the coupon.

PipeDream 3 is for all Archimedes computers with RISC OS and 1Mbyte of RAM.

PipeDream 3 costs £147.00 +VAT.

Major features include:

- many documents loaded at once
- intuitive RISC OS user interface
- displaying and printing of pictures within text
- built-in 93,003 word spelling checker
- file compatibility with PC & Z88 PipeDream and BBC View Professional
- background recalculation
- keystroke compatibility with Z88 & PC PipeDream
- Z88 filing system
- automatic loading of VIEW, ViewSheet, Lotus, First Word Plus, Tab and CSV files
- automatic saving of VIEW, Lotus, Acorn DTP format, Tab and CSV files
- multi-field sorting
- use of all available fonts
- 62 spreadsheet functions
- external references for 3-D modelling
- macro file recorder
- slot protection

For a free brochure, complete and return this coupon
PipeDream 3 ☐ View Professional ☐

Name

Address

Post code

Colton Software, Broadway House, 149-151 St. Neots

Road, Hardwick, Cambridge CB3 7QJ, England.

Fax: 0954 211607 Tel: 0954 211472 AU/5/90

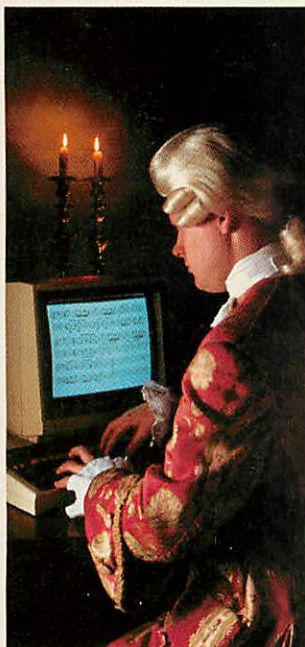
All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge, CB3 7QJ, England.

Fax. 0954 211607 Tel. 0954 211472

MAY 1990 ISSUE No 94

66 BEAT MASTER



Cover photograph by John Barlow

119 PICKING UP THE PIECES



NEWS	7
COMMS	15
MUSIC	17
EDUCATION	20
NEXT MONTH IN BAU	22
LETTERS	23
QUESTIONS AND ANSWERS	26
RISC REVUE	30
EIGHT BITS	58
IN THE MODE	64

À la mode design on the Archimedes

COVER FEATURE

BEAT MASTER	66
-------------	----

Tune in to your BBC micro and in no time you could be strumming along with all the facilities of a mini studio

BORN AGAIN	73
------------	----

Life in the fast lane – BBC micro style

PRECISION MADE	75
----------------	----

The BBC micro travels to far-off decimal places

STAR GAZING	78
-------------	----

Looking to the future of IT in schools

QUICK TURNAROUND	80
------------------	----

Shape up with graphics that will turn heads

READING MATTER	83
----------------	----

Easy transfer of Beeb discs to your Arc

SPECIAL OFFERS	105-112
----------------	---------

EASY TO IMPRESS	113
-----------------	-----

Impressive desktop publishing from Computer Concepts

SCREENED FOR VALUE	117
--------------------	-----

Microvitec's new monitor for the A3000

PICKING UP THE PIECES	119
-----------------------	-----

The ultimate in jigsaws for learning or leisure

COMPOSE YOURSELF	120
------------------	-----

Sounding out music software for schools

NEW LAMPS FOR OLD	123
-------------------	-----

Expanding on the Integra-B from Computech

DRIVE ON	124
----------	-----

A range of disc buffers for the Archimedes

FIRST UP	127
----------	-----

The updated *First Word Plus* is here at last

GAME SHOW	128
-----------	-----

TURNING A NEW LEAF	132
--------------------	-----

Flicking through two hypermedia packages

SOFTWARE SHOWCASE	134
-------------------	-----

END USER	136
----------	-----

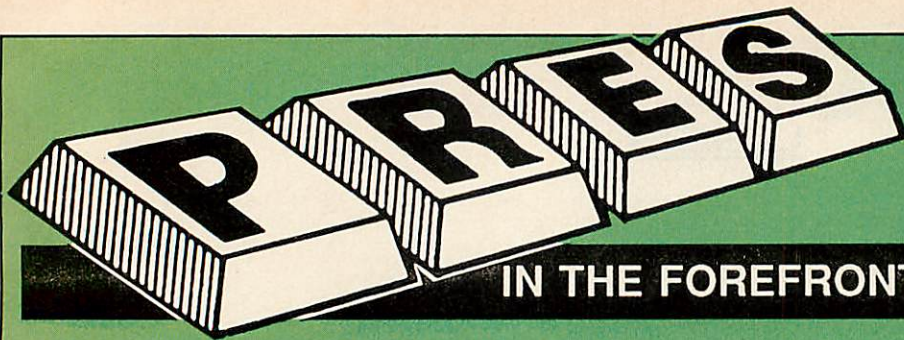
The BBC Master strikes it lucky with Thames TV

80 QUICK TURNAROUND



128 GAME SHOW





Tel: 0276 72046
Fax: 0276 51427

IN THE FOREFRONT OF A3000 UPGRADES

Pres is committed to providing a full range of compatible upgrades for the Archimedes A3000

The range starts with a carefully thought out monitor plinth 'A3K1' which allows the A3000 to move freely back and forth making the most of limited desk space. In response from initial users we have also incorporated a way of preventing accidental access to the reset switch. Where security matters it is also possible to fix the plinth to a desk.

A3K1 is expandable to A3K2, a styled housing to take the A3000 to a system. A3K2 is supplied with a post regulated, switch mode power supply and provides the means for adding up to 2 additional floppy drives (2 x 3.5" or 1 x 3.5" + 1 x 5.25") and a Winchester hard disc drive. All these can be added without having separate boxes hanging from the computer on ribbon cables.



PRES have also allowed for adding standard expansion cards (podules) on the rear of the machine. This is done by means of a casing which attaches and is fixed to the A3000 case providing full protection for the expansion card. However it does not stop there. The case is expandable to take a backplane and expansion board which can accommodate FOUR mini cards. PRES will release the specification for the mini cards to any third party wishing to have their products on A3000. PRES are currently working on a range of Mini Cards, plans include . . . high spec analogue to digital converter, user ROM and battery backed RAM, SCSI, MIDI, 2nd. vdu.

A3K1 Monitor Plinth
£24.95

A3K2 System Housing
£69.50

A3K3 External Podule Case
£14.95

A3K6 Disc Buffer Board
£48.95

A3K12 65 Host DFS and DFS Filer
£19.95
Upgrade for A3K6

A3K7 Hard Disc Upgrade
£429.50
(includes hard disc controller card)

The addition of a 5.25" disc drive is made possible with the Disc Buffer Board (A3K6). It fits inside the A3000 and still allows for the 1MHz bus and user port to be fitted, allowing for maximum internal expansion. A3K6 is supplied with On Board firmware for assigning drive numbers and 40/80 stepping.

Another product to help users move forward from their 8 bit machines will be A3K12 . . . an ARM 1770 DFS for use with the new 65 Host. A3K12 is a ROM upgrade (for A3K6) and disc which allows 65 Host to be 'icon booted'. A3K12 also includes an invaluable DFS Filer, this is a desktop application which facilitates dragging DFS files from a viewer to an ADFS viewer or application (i.e. Edit): An easy way of getting at all those View files on 5.25" DFS!

PRES has not forgotten the internal expansion either . . . apart from a disc buffer board; there will also be options of User Port and 1 MHz bus. There are even more products being planned by PRES for future release, so . . . watch this space.

A3K8 3.5" Additional Floppy Disc Upgrade
†
£75

A3K9 5.25" Additional Floppy Disc Upgrade
†
£99.95

2-4 Meg Upgrades

Internal 1MHz Bus/ User Port Podule

External Podule Expansion

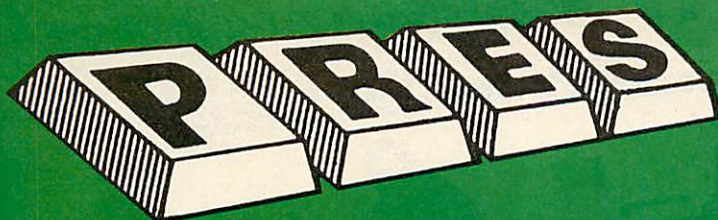
Mini Expansion Cards

Please call for details of your nearest Acorn Dealer.

Dealer and Educational enquiries welcome

†Cabling required
All prices exclude VAT

P.R.E.S. LTD., PO BOX 319, LIGHTWATER, SURREY GU19 5PW



PRES POLICY

1. To provide the best possible service & assistance to users.
2. Supply Acorn based or Acorn compatible products & to enable upward compatibility wherever possible.
3. Provide tested products with special attention to quality of design, components & production.
4. **Only to cash cheques & credit card receipts when we know we can supply the goods ordered.**

THE ADVANCED PLUS 3 MKII

The only fully compatible disc upgrade running Acorn's own filing system.

COMPLETE PACKAGE ONLY

£129 excl VAT; £148.35 Inc VAT (E+1)

ADVANCED PLUS 5

A unique interface for those wanting the maximum expansion from just one slot in the PLUS 1.
£58.00 Ex VAT; £68.24 Inc VAT (E+1)

ADVANCED PLUS 1 ... The plus 1 is the main expansion for the Electron as designed and originally produced by Acorn. The only currently advertised addition to the Electron that is a fully compatible, cased unit, that we can recommend for future upgrades. i.e. disc upgrades such as AP3, AP4.
£50.00 Ex VAT; £57.50 Inc VAT (E)

ADVANCED PLUS 6 ... a fully buffered 6 ROM expansion module for the Electron user.

£33.00 excl VAT; £37.95 Inc VAT

UPGRADE SERVICE for the original Acorn Plus 1 to Advance Plus 1 and AP6.

£40.00 excl VAT; £46.00 Inc VAT (E+1)

ADVANCED ROM ADAPTER 2

An Acorn approved cartridge containing a card with special 'zero' profile sockets.

£13.00 excl VAT; £14.95 Inc VAT (M,W,+1)

ADVANCED BATTERY-BACKED RAM

A standard Acorn approved cartridge but 32K (2x16K) of sideways RAM, inc. Software Protect Facility.

£39.00 excl VAT; £44.85 Inc VAT (M, E+1)

DISC INTERFACES

(Plus One required)

AP3 INTERFACE: As supplied with AP3 package.
Price £52.00 ex VAT £59.80 Inc VAT

AP4 INTERFACE: A fully Acorn compatible disc interface
Price £60.83 ex VAT £69.95 Inc VAT

AP34 INTERFACE: Get the best of both filing systems
Price £69.55 ex VAT £79.98 Inc VAT (E+1)

ADVANCED PLUS 2 ROM

We feel this is one of the best, low cost, additions we have produced for the Electron & +1 user, especially for Plus 3, AP3 & ABR users.

£11.00 ex VAT; £12.65 Inc VAT (E+1)

ADVANCED PLUS 7

An internal battery-backed RAM upgrade for the Advanced Plus 6.

£39.50 ex VAT; £45.42 Inc VAT (M, B, E+1)

USER PORT

A low cost unit for those who just require a user port interface.

£19.99 ex VAT; £22.95 Inc VAT (E+1)

ADFS VERSION 1.1

Suitable for existing Plus 3 or A.P.4 users.

£14.95 ex VAT; £17.19 Inc VAT

ADFS E00

For Electron users with either Plus 3 or A.P.4 and 32K of S/W RA, i.e. ABR

£14.95 ex VAT; £17.19 Inc VAT;

5.25" ADFS (manual avail. sep.) £14.00 ex VAT

£16.10 Inc VAT

5.25" DFS (2 discs+ ADFS manual) £19.00 ex VAT;

£21.85 Inc VAT

AP4 MOD

This converts an AP3 to an AP34 (ie DFSE00) supplied as a two chip set, full documentation and fitting instructions.

£21.74 ex VAT. £25.00 Inc. VAT (E1)

ADVANCED COMPENDIUMS - ON DISC

Vol. 1

Invaders	Croaker
Jet Power Jack	Felix in the Factory
Killer Gorilla	Bandits @ 3
Stock Car	Bumble Bee

Vol. II

Felix and the Fruit	Rubble Trouble	Moonraider
Monsters	Swag	Frenzy
The Mine	Cyberton Mission	Escape Moonbase Alpha

Vol. III

Danger UXB	Adventure	Chess
Ghouls	Positron	Galactic
Felix and the Evil Weevils	Swoop	Command



Vol IV

Arcadians	Magic Mushrooms	Bug Blaster
Meteros	Monsters	Video
Snooker	Qwak	Revenge

Vol. V

Starship Command	Cosmic Camouflage
Maze	Guardian
Killer Gorilla 2	Stranded
Frak	Constellation

Vol. VI

Planetoid	World Geography
Zalaga	Alien Dropout
Fruit Machine	Centibug
Invaders	Percy Penguin

3.5" £9.99 ex VAT each volume; £11.49 Inc VAT

5.25" £8.99 ex VAT each volume; £10.34 Inc VAT (E)

DISC DRIVES

	Ex VAT	+ VAT
Cumana 5.25" dbl/sided 40/80 track, switchable, inc. psu	£113.00	£129.95
Cumana 5.25" single/sided 40 track, inc psu	£112.17	£129.00
PRES Special 3.5" double sided 80 track, Inc. psu	£78.00	£89.70

VIEW CARTRIDGE

The Acornsoft word processor for the Electron and Plus 1. Inc full documentation £14.95

VIEWSHEET CARTRIDGE

the Acornsoft spreadsheet for the Electron and Plus 1, Inc full documentation £14.95

VIEW & VIEWSHEET

Both products as above 'special price' £19.95 (E+1)

SPECIAL PACKAGE PRICES

	Ex VAT	Inc VAT
AP1 + AP3	£165.00	£189.75
AP1 + AP6	£77.00	£88.55
ABR + 3.5" ADFS E00	£48.65	£55.95
ABR + 5.25" ADFS E00	£46.95	£53.99
ABR + 5.25" DFS (ADFS E00)	£51.00	£58.65
AP5 + Music 5000	£152.17	£175.00
AP7 + 3.5" ADFS E00	£49.52	£56.95
AP7 + 5.25" ADFS E00	£48.65	£55.95
AP7 + 5.25" DFS (ADFS E00)	£52.13	£59.95
AP4 + CS400	£147.78	£169.95
AP1 + AP4 + CS400	£189.00	£217.35

ACCESSORIES

ELECTRON POWER SWITCH

£3.96 ex VAT; £4.55 Inc VAT (E)

AP3 2nd DRIVE LEAD

£5.96 ex VAT; £6.85 Inc VAT (E)

PLUS 3 2nd DRIVE ADAPTOR

£6.91 ex VAT; £7.95 Inc VAT (E)

Panasonic KX-P1081 Printer Ribbon
£5.50 ex VAT; £6.32 Inc VAT

ELECTRON ADVANCED USER GUIDE

Further reading and information for the Electron User £3.95
ADFS Guide Manual £5.00 (E)

ADVENTURE GAMES ON DISC

3.25" ADFS £6.95 ex VAT per Disc; 7.99 Inc VAT Per Disc (E)

PRINTER

Panasonic Matrix with NLQ

£155.65 ex VAT

£179.00 Inc VAT (M,B,E+1)

NEW PRODUCT

ADVANCED BASIC EDITOR

Available Cartridge £32.00 ex VAT

£36.80 Inc VAT

Rom Module £24.95 ex VAT

£28.69 Inc VAT (M,B,E+1)

"It is probably the most powerful software to be released for the Electron for a long time. I can fully recommend this most useful package"
EU/SEPT/89

MUSIC 5000

£99.00 ex VAT; £113.85 Inc VAT (E+1)

NEW PRODUCT

A new 1Mhz Bus low cost

cartridge - £19.99 ex VAT;

£22.99 + VAT (E+1)

DISCS

3.5" in plastic library box - ideal for Plus 3 users £19.95
5.25" 10 dbl/sided dbles/dens £12.99
5.25" sing/sided sing/dens £8.99
5.25" Twin Gift Pack £1.49

All items on this page are available mail order only. Prices include UK delivery & VAT (subject to availability). Please send or phone your order to



(In event of any query - please include your tel. no.)

P.R.E.S. LTD., PO. Box 319, LightWater, Surrey, GU18 5PW. Tel: 0276 72046 (24 hr). Fax: 0276 51427

Name	Product	Qty	@	Total
Address				
Postcode				
Tel:	I enclose payment for £			
Credit Card No.:	Exp date (Ref A4)			

KEY CODE M = MASTER B = BBC E = ELECTRON +1 = PLUS1

RISC USER

is MORE THAN JUST A MAGAZINE!

RISC User provides comprehensive support for everyone who is a user of the Archimedes or the new BBC Micro – the A3000.

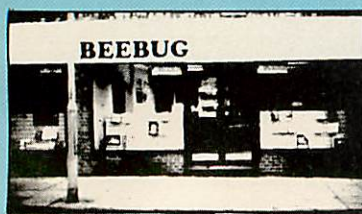
... RISC User is the world's largest Archimedes Support Group.

When you subscribe to RISC User, you become part of a professional organisation, staffed by computer enthusiasts whose aim is to provide all the information, help and support that you may need.

When you subscribe to RISC User:

- You can benefit from our **FREE Technical Support Service**
- We have our own **Showroom** where you may browse or buy, in a friendly unpressurised atmosphere
- You can come and meet our Technical or Editorial staff **face to face** in our Showroom
- You can benefit from **BEEBUG's own quality software and hardware** products, or
- You can order from what maybe **the largest range** of Archimedes software and hardware available anywhere
- You will receive a **Retail Catalogue** with your magazine, and you can use our **Tele-sales** service and our speedy **Mail order** service by simply quoting your membership number
- You will be entitled to a **member's discount** on a wide range of products, and **special discounts** on a variety of BEEBUG's own products
- You can benefit from our **Trade-in service** should you wish to upgrade your equipment
- You can have your equipment repaired or upgraded by qualified staff in our own **Workshop**
- **And of course, you will receive ten magazines per year, totally dedicated to the Archimedes and the A3000, magazines full of:**

News on the world of Archimedes, Utilities and useful Routines, Ready to run Applications, Reviews of the latest products, Hints and Tips on programming, Advanced programming techniques, Hardware series, Tutorial articles and beginner's guides, Postbag, Technical queries and expert answers



BEEBUG LTD

117 Hatfield Road, St. Albans,
Herts AL1 4JS
Tel: 0727 40303 Fax: 0727 60263

Please send an information pack containing a sample issue for £1.50 (overseas £2.00) ☐

I would like to subscribe to RISC USER Magazine and Support Group ☐

I enclose a cheque for £_____ (all cheques must be in pounds sterling, drawn on a UK bank) or,

Please debit my Access/Visa account No.

Card Expiry Date



Signature _____

Name _____

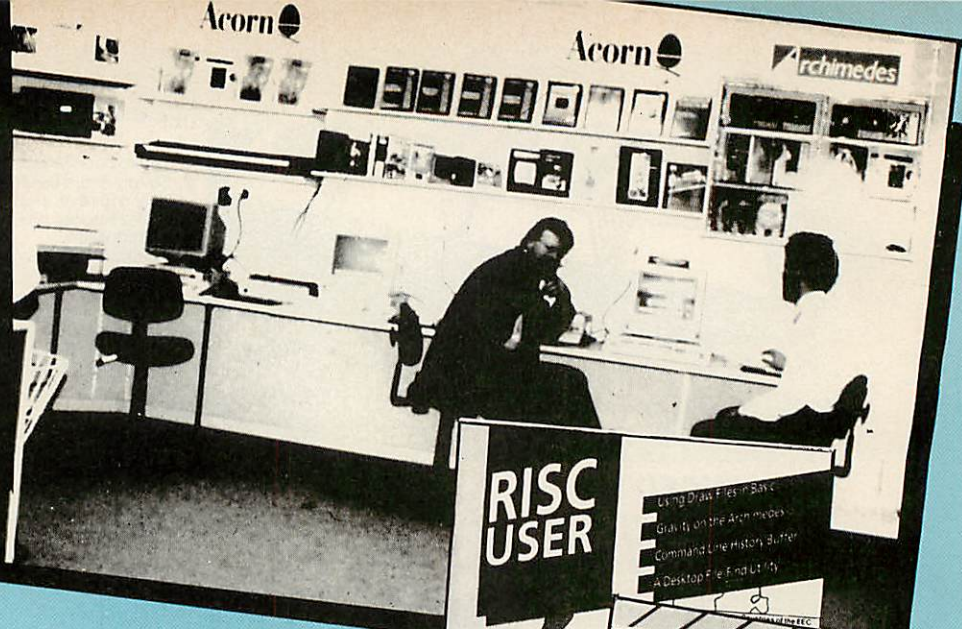
Address _____

Post Code _____

A5

RISC USER SUBSCRIPTION RATES (1 YEAR)

£16.90 UK, BFPO, CH.I
£24.00 Rest of Europe, Eire
£29.00 Middle East
£31.00 America & Africa
£34.00 Elsewhere



ACORN AT WHICH?

Computing solutions will be the focus of the Acorn stand at this year's *Which?* Computer Show.

Held from April 24-27, Acorn will be demonstrating complete systems for the Archimedes 400/1, A3000 and its Unix R140 workstation.

Packages dealing with administration, management and training in the health service, education and government, as well as small businesses will be on show. Those demonstrating their wares include Foster Findlay and Wild Vision for image processing, and Westland System Assessment and Software Solutions with CBT software.

Oak and Silicon Vision will be demonstrating various CAD packages. Acorn will also be demonstrating its new CD-Rom drive which was first shown at BETT 90.

NEW NUMBERS

Please note that from May 6 the prefix for the BAU house telephone number will change from 01 to 071. This will also apply to our fax number. Callers from outer London (081) or beyond should use the new area code.

ACORN RE-ENTERS HOME MARKET WITH THE LEARNING CURVE

Acorn has launched a bundled package aimed at home users which includes an A3000, colour monitor and £300 worth of application software for just over £1000.

Launched in early April, The Learning Curve is an education-based package which aims to encourage the use of the A3000 for home learning.

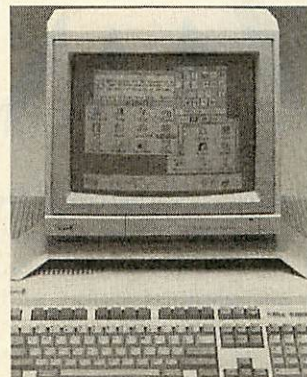
The package includes Acorn's *First Word Plus* release 2 (see review on page 127), together with Software Solutions' hypermedia application, *Genesis*. A *Genesis* application and examples disc plus a version of the PC Emulator featuring DR Dos compatibility is also supplied.

Also included in the package is a 15 minute video hosted by

TV educationalist Fred Harris. In it he explains how to set up the system, and gives examples on how to use the supplied software. A booklet prepared in conjunction with *The Observer* newspaper entitled 'Your child and the National Curriculum' is also supplied.

Two variants of The Learning Curve are available. The first with 14in colour monitor and stand costs £949 (ex VAT). The second at £699 (ex VAT) does not include monitor or stand, and requires a TV with a SCART connector. Both packages represent a saving of around £300.

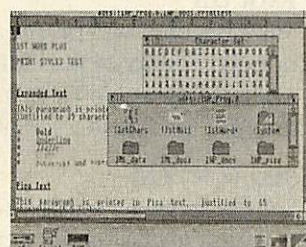
Acorn is promoting The Learning Curve with a major press and TV campaign. Adverts are currently being shown



on TV South, and national coverage will follow. 'A lot of effort has gone into putting this package together' said Bob Coates, Acorn's Consumer Sales and Marketing Manager. The package has been devised with the co-operation of parents, educationalists, headmasters and market research.

According to Coates, The Learning Curve 'is an attempt to take Acorn back into the home market in a big way'. Acorn is on (0223) 245200.

● A competition where you can win The Learning Curve (complete with monitor and stand) will appear in the June issue of *BBC Acorn User*.



First Word Plus and Genesis come with The Learning Curve

NEW MD AT ACORN COMPUTERS



Acorn Computers has recently undergone a top-level management reshuffle leading to the appointment of a new managing director.

The directors of Acorn Computer Group plc appointed Sam Wauchope as MD of Acorn Computers Ltd.

Wauchope has been with Acorn for five years, and has been promoted from sales and marketing director. His appoint-

ment follows the promotion of former MD Harvey Coleman, who takes up a new role as president and chief executive officer of Olivetti Systems and Networks Canada Ltd.

The position of Sales and Marketing director has been filled with the appointment of Michael O'Riordan, who was until recently marketing director of ITL.

Commenting on the changes,

Alex Uboldi, Acorn's chairman, said that Coleman's promotion is recognition of the excellent results achieved by Acorn during the time he has been managing director.

In a speech to senior staff, Coleman announced that Acorn would enhance its activities in the home market, and that the company would be announcing a major new initiative to enhance its activities in that area.



Editor Geoff Bains. Assistant Editor Pauline McLernon. Technical Editor Robert Miller. Education Editor Lisa Hughes. Editorial Assistant Christina Neal. News David Janda. Art Editor Tim Harding. Ad Manager Roger Mullins. Deputy Ad Manager Duncan Pringle. Sales Executives Richard Power, Matthew Thistle. Ad Production Liz Walsh. Production Manager Jennifer Jeffrey. Managing Editor Ellen Brush. Publisher Seamus Geoghegan. Publishing Director Michael Potter. Editorial Director Christopher Ward.

Published by Redwood Publishing, a BBC Enterprise Company, 20-26 Brunswick Place, London N1 6DJ. Tel: 01-490 1444. Telecom Gold 81: RED001, Micronet 919992492. Printed by Riverside Press, Gillingham. DTP page make-up by Pressgang Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ. Typesetting by CB Origination, 182 Pentonville Road, London N1 9LB. Colour by Trumps Studio, Ware, Herts. Distributed by BBC Magazines, 35 Marylebone High Street, London W1. © Redwood Publishing 1990. All rights reserved. Acorn is a registered trademark of Acorn Computers Ltd, Redwood Publishing is a registered data user. ISSN 0263 7456.





THE LEARNING CURVE

BEEBUG SPRING OPEN DAY and SHOW

Everyone is welcome at:
**117 Hatfield Road, St Albans,
Herts.**
on
Sunday 22nd April 1990

An Acorn 'Qualified Dealer'

Beebug is one of the largest Acorn Dealerships in the country. You are very welcome to visit us on our Open Day and mini-exhibition. Acorn Computers themselves will be present, along with a number of other companies.

Wide Stock Range

We have a very wide stock range, from computers, printers and software, right through to spare parts, such as keyboards and power supplies. All will be available on sale.

Beebug and RISC User Magazines

We also publish the acclaimed Beebug and RISC User magazines for the BBC Micro, Master and Archimedes/A3000 computers. Back issues will be available at special prices. The editorial team will be on hand to discuss the magazines and their contents.

Beebug DTP

Ovation, the new **DTP** system for the Archimedes will be on demonstration, along with our **scanner, 5 1/4 disc buffer** and our new **memory upgrades** for the A3000.

Demonstrations

Our technical team will be present to demonstrate and discuss items of software and hardware that might be of interest to you.

Instant 0% Finance

Mercantile Credit will be attending so we can offer instant 0% Finance on all new Acorn Computers, enabling you to take your new computer away with you on the day.

Special Offers

Special reductions and clearance offers on a wide range of items with many available in our "£5 bargain bin".

HOW TO FIND BEEBUG

By Car - St Albans is easily reached from A1 A5 A6 M1 and M25.

By Train - We are 10 minutes walk from St Albans City Station on the King's Cross to Bedford line.

Companies represented include:

Acorn Computers

A number of Acorn staff will be on hand to demonstrate and discuss the complete range of computers including the A3000.

Colton Software

Pipedream 3, the efficient spreadsheet/ wordprocessor/ database for the Archimedes will be on demonstration together with View Professional for the BBC B and Master.

EMR Ltd

Mike Beecher will be attending to demonstrate the popular Studio 24 Plus MIDI Music package for the Archimedes as well as his range of MIDI add-ons for the BBC and Master series.

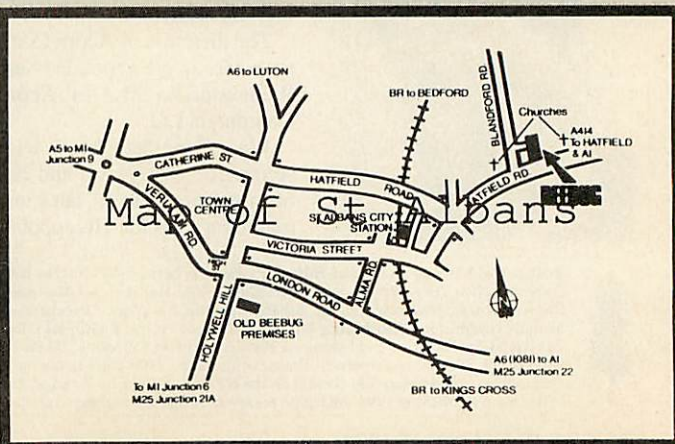
Star (UK) Ltd

See the business and professional range of Star printers in action including the new XB24-10 colour printer. The range of Star laser printers will also be on demonstration.

Fourth Dimension

Fourth Dimension will be demonstrating their excellent range of games for the BBC Micro and the Archimedes..

Events & visiting companies subject to change without notice.



32MB ARC APPLICATIONS

The first of a new range of aids from DT Software increases the apparent memory available for an Archimedes C application to 16 or 32Mbytes.

DT-VM uses virtual memory techniques to 'fool' the Archimedes into thinking that there is more memory in the machine. This is achieved by swapping sections of memory to and from hard disc.

The package, which costs only £7, is suitable for linking into programs developed with releases 2 and 3 of Acorn's ANSI C compiler. It will not work with existing applications. Information sheets are available from DT Software, 13 Northumberland Road, Leamington Spa, Warwickshire CV32 6HE.

CHEAP LASER

Crown Computer Products is currently selling what it claims to be the lowest cost laser printer on the market.

Due to its large purchasing power, Crown is offering a limited number of the Ricoh 4081 laser printer at £700 (ex VAT). The unit features eight page per minute output at 300x300 dpi resolution.

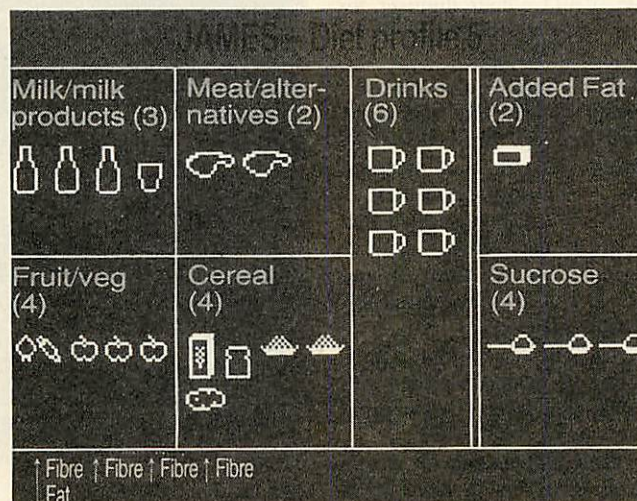


COMPACT ADAPTOR

Jafa Systems, manufacturer of the Romplus-144 sideways Rom board for the Electron has released a Master Compact cartridge adaptor.

It consists of a PCB which plugs into the side expansion connector and includes a switch to select between Master or Electron cartridges. The unit costs £25 inclusive of VAT. Jafa is on (0222) 887203.

HEALTHY BYTES FOR TODDLERS



The National Dairy Council has released a personal food and fitness profile program for use on the BBC model B and Master computers.

Healthy Bytes introduces pupils to the principles of healthy eating and physical activity, while emphasising the role that variety plays in the food we eat and the importance of dietary balance in ensuring good health.

The package has been designed by Dr Judi Buttriss, senior nutritionist at the Council, for use with children aged between nine and 13. It consists of a disc, a teacher's manual and worksheets for the pupils.

The package represents the Council's first venture into computer aided learning, and costs £12.50. The National Dairy Council can be contacted on 01-499 7822.

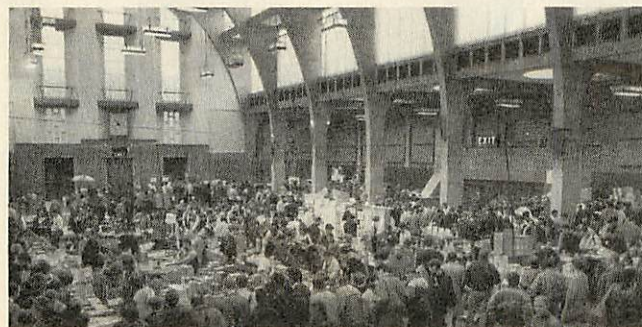
BARGAINS GALORE AT FAIR

A barrow-boys' computer exhibition to end them all is to be held between April 28-29 at the New Horticultural Hall.

The second All Formats Computer Fair, as the name suggests, caters for anyone interested in home computing at

bargain prices. According to Marketing Consultant, Bruce Everiss, the first show in February attracted 'several thousand enthusiasts', hence the repeat performance.

Everiss can be contacted on (0926) 640137.



LASER DISC FROM SHELL

An interactive video project pack for use on the Domesday system has been released by Shell Education Services.

The pack is a spin-off from a laser disc system developed by Shell UK to provide route maps in filling stations. The disc provided with the pack contains thousands of national and local road maps for the UK. Of particular use in history, geography and economics, the software allows pupils to build their own databases.

At £160 (ex VAT) the pack comes with a booklet and sample programs to demonstrate the system in action. Users can also write their own demonstration systems with the software supplied. The video system is also available for Sony, Philips and Pioneer players.

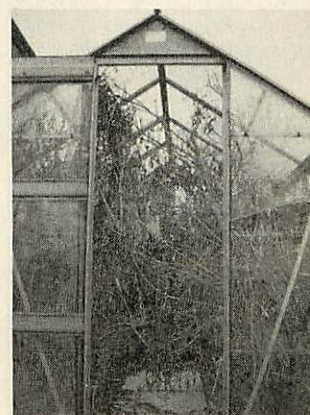
More information is available from James Arnott at Shell UK on 01-257 3152.

RED ALERT

The experimental project to increase tomato growth by playing sounds from an A3000, revealed in last month's End User, has suffered a terrible set-back.

After accidentally playing acid house music to the entire tomato plantation, the melon-sized fruit has shrivelled.

Well, all right, the story was nowt but an April fool and experimentalist Allen Broods is just a load of 'Red Balloons'.



NEWS IN BRIEF

● Citizen has introduced the first nine and 24-pin colour printer driver to ensure compatibility between Acorn Archimedes and Citizen colour printers.

The colour driver is available on disc for £10 and allows colour printing using any Citizen colour dot matrix printer including the Swift 24.

● Computer Concepts has decided to release an educational network version of *Impression* that does not require a dongle.

The networked protected version has been released as 'some schools are worried that the dongle may be stolen.' Computer Concepts is on (0442) 63933.

● Circle Software has adopted what it thinks is a unique system of protection for its Archimedes products. The system involves an embedded serial number. For the software to work a password is required. Circle Software is on (0793) 770021.

DIARY DATES

22 April. Beebug Spring Open Day. Contact: Beebug on (0727) 40303.

24-27 April. Which? Computer Show, National Exhibition Centre, Birmingham. Contact: Reed Exhibitions on 01-948 9800.

28-29 April. The First All Formats Computer Fair, New Horticultural Hall, Victoria, London. Contact: John Riding (0225) 447453.
9-11 July. Acorn Networks '90 - the fifth annual computer networking conference, Keele University, Staffordshire. Contact: Sarah Scott on (0223) 245200.

25-28 September. Business Computing '90, Earls Court, London. Business and trade exhibition only. Contact: Monthbuild on 01-486 1951.

DIGITISE ON THE ARC

Image analysis specialist Digithurst Ltd has released a £495 (ex VAT) colour digitiser for the BBC A3000 and Archimedes 400 series.

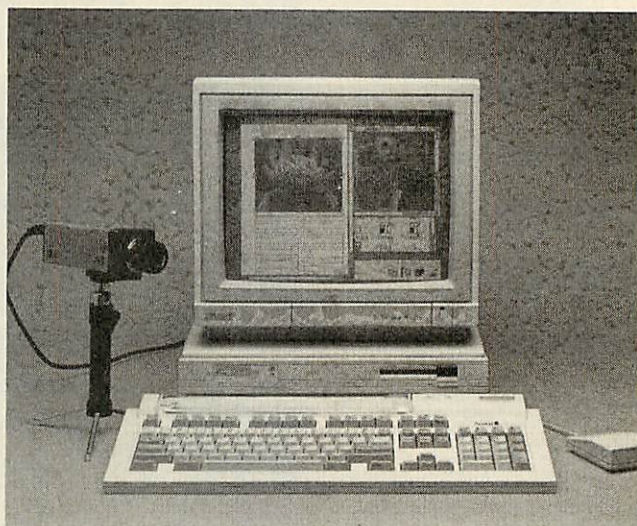
The package also includes utility software that runs on the Arc desktop. This allows the transfer of images to memory, disc, or to other applications.

Images may be scaled and clipped, and software controls for saturation, contrast and brightness of the captured image are provided.

The Microeye AI has a resolution of 640x256 pixels with 24 bits of colour information per pixel.

Data is available for image processing, but in sprite form images are reduced to 12 bits per pixel which gives an effective palette of 4096 colours.

In sprite form images can be transferred between applications



such as *Acorn DTP* and *Paint*.

Two versions of Microeye are available. A plug-in board with a back-panel that carries an input connector for RGB/Video is available for the 400 series.

For the A3000 the board is supplied mounted in a separate external box which plugs into the expansion connector.

Digithurst is on (0763) 242955.

ARC MEDICAL LAB

A computer-based teaching facility has been opened at Newcastle University's Medical and Dental School.

The large multi-disciplinary laboratory has recently installed an additional 16 Archimedes 410 computers.

This brings the total number of Arcs at the laboratory up to 25. All the computers are connected together by an Econet

network that stretches over one kilometre.

The Acorn systems provide a fully integrated solution for the acquisition, display and analysis of experimental data using a wide variety of standard software and also software developed in-house.

For more information on the university's setup contact Dr Gary Green on 091-222 6000.



FONTASTIC NEWS

Ian Copestake Software and the Electronic Font Foundry have each released a new collection of quality fonts especially designed for the Archimedes range of computers.

Over 100 outline fonts are available at an average of £5 per font. Copestake is offering a price reduction if fonts are purchased with either the Acorn *DTP* package, *Impression* or *Pipedream 3*.

Ian Copestake Software is on 051-648 6287; EFF can be contacted on (0990) 28698.

● Beebug is also supplying outline fonts. A pack containing 13 outline fonts, each with 190 characters is supplied together with a 'PSprolog' file which allows the new typefaces to be printed on Postscript printers.

Outline Font Pack 1 costs £54.50 (inc VAT), and is the first in a series. Beebug is on (0727) 40303.

In these fast moving times
it is comforting to know that
some things don't change

...and you can still get good
quality programs and first class
support for your



**BBC
MODEL B
or MASTER**



...**BEEBUG** is the
only magazine dedicated entirely
to the **BBC Model B** and the **Master series**

Subscribe to BEEBUG and receive 10 magazines a year all packed with:

- Ready to run applications
- Utilities and handy routines
- Tutorial articles and beginner's series
- Workshop for the more advanced programmers
- Games and games reviews
- News from the BBC world
- Reviews of the latest products
- Hints and tips on programming
- Postbag for your letters and answers to your questions

Subscribe to BEEBUG and benefit from Britain's largest BBC User Group:

- Free Technical support service
- Showroom where you can try out the latest software and hardware
- Speedy Mail-order service
- Discounts on a wide range of products
- Special discounts on a variety of BEEBUG's own products
- Workshop repairs by qualified staff
- Trade-in service should you wish to upgrade your equipment

BEEBUG SUBSCRIPTION RATES (1 YEAR)

£16.90 UK, BFPO, CH.I
£24.00 Rest of Europe, Eire
£29.00 Middle East
£31.00 America & Africa
£34.00 Elsewhere

I would like to subscribe to BEEBUG Magazine and Support Group ☐

Please send an information pack containing a sample issue for £1.50 (overseas £2.00) ☐

I enclose a cheque for £_____ (all cheques must be in pounds sterling, drawn on a UK bank) or,

Please debit my Access/Visa account No.

Card Expiry Date

Signature _____

Name _____

Address _____

Post Code _____

A5

PINEAPPLE SOFTWARE

STOP PRESS — NOW AVAILABLE Archimedes real time colour video digitizer

- ★ Resolution 512 × 256
 - ★ 12 or 16 bits per pixel
 - ★ full PAL delay line decoder
 - ★ comprehensive software module with many star commands and SWI's to manipulate image
 - ★ 12 bit from £285, 16 bit from £315
 - ★ Pineapple has produced one of the 'ultimate' computer based Video Digitizer Acorn User April '90
- Please write or telephone Pineapple for full details.

HOME ACCOUNTS

This very popular program from Pineapple offers the simplest solution to keeping track of all your home accounts. The program is unbelievably simple to use but still offers all the essential features such as automatic standing order handling, statement reconciliation etc. Any number of accounts may be stored on disc and transfers between accounts requires only a single operation. Available for model 'B', Master and Compact with disc drive.

PRICE £19.95 P&P free

ADFS UTILITIES ROM

ADU is an invaluable utility for all ADFS users. It adds over 22 new * commands to the ADFS filing system as well as providing an extensive menu facility with over 35 sub-commands covering areas such as repeated disc compaction, saving and loading rom images, auto booting of files and many more.

Transferring of files from DFS to ADFS is very simple using the *DFSADFS command. Backing up of discs of different sizes is also allowed, so Winchester's may be backed up easily to a predetermined number of floppies.

PRICE £29.00 P&P free

Please add 15% VAT to all prices

BBC PCB DESIGNER

PCB is a powerful Rom based printed circuit design program suitable for all BBC computers including the Archimedes. It's fast high density 1:1 or 2:1 scale print routine allows prototype boards to be made directly from a printout. The 2:1 print routine provides artwork quality suitable for the most discerning PCB manufacturer. A second Eprom is optionally available to add a powerful auto-track routing facility to the program. This utilises a 'rats-nest' input routine and allows any component to be 'picked-up' and moved around the board without having to re-specify track requirements.

The full auto route facilities are available even on an un-expanded model 'B' computer.

'PCB autoroute is remarkable. No similar software comes near the price'

Acorn User — Aug 88

'Although it appears expensive, there is nothing else remotely similar even on other micros for less' — Beebug, April 88.

PCB Manual track routing	£85.00
PCB Auto-routing	£185.00
PCB Plotter driver	£35.00

P&P free

DIAGRAM II

Still the only BBC drawing package to allow really large diagrams (up to 30 mode 0 screens) to be created. The unique scrolling and indexing system allows easy access to any part of the diagram, and the rapid line drawing routines allow diagrams to be drawn really quickly. The print routines provide unequalled flexibility with infinitely variable H & V scales and 90 deg rotation if required. The smallest scale allows up to 18 mode 0 screens to be printed on an A4 sheet with clearly readable text and full use can be made of wide carriage printers.

The quality of printing is the last factor which makes Diagram II so outstanding. The package really is capable of producing top quality diagrams' — ETI March 88.

Specially reduced price £25.00 P&P free

MARCONI TRACKERBALLS

We now have an adapter available to link the trackerball to the Archimedes.

Bare trackerball (no software)	£49.83	For model 'B' (inc. IconArt)	£54.83
For Master with Pointer Rom	£54.83	Pointer Rom for Master	£12.50
Adapters to drive Mouse s/ware	£8.00	Archimedes adapter	£19.95
Trackerballs for Archimedes Computers	£49.83		

Trackerballs are also available for other computers — please 'phone

Postage and Packing on trackerballs £1.75

ROLAND PLOTTERS

DXY 880A	£545.00	DXY 1100	£625.00	DXY 1200	£865.00
DXY 1300	£1125.00	P & P on all plotters			

EASY-PC	£98.00	IBM SOFTWARE and HARDWARE	ECA-2	£675.00
PCB Turbo	£395.00	Spice, Age from		
DATA CAP RS232 serial data analyser	£25.00	LCA-1 logic analyser		
		Full range of Elonex Computers available please 'phone for prices.		



Please address
all enquiries to:-

Pineapple Software, Dept. AU, 39 Brownlea Gardens,
Seven Kings, Ilford, Essex IG3 9NL

Tel 01-599 1476



MAIN MEDIA

BRANDED 3.5" DISKS

3M	£12.50
SONY	per box
VERBATIM	of 10

BRANDED 5.25" DISKS

3M	£7.50
VERBATIM	per box
TDK	of 10

BULK 3.5" DISKS

3.5" DS/DD 135tpi
(SONY/VERBATIM)

20	£17.25
50	£34.00
100	£67.00
200	£132.00

BULK 5.25" DISKS

5.25" DS/DD 48tpi
(BASF)

25	£7.25
50	£14.00
100	£27.00
200	£52.00

PRINTERS

STAR LC10 Mono	£159.95	£205.95
----------------	---------	---------

All printers supplied with cables.
Genuine UK Products. 12 Months back to base warranty

We also stock disc boxes, cables, ribbons etc.
Please phone for copy of latest catalogue.

All prices include VAT. Please add £2.50
for disc orders and £5.00 for printer orders.

MAIN MEDIA, Dept. CS

FREEPOST, Andover,
Hants. SP10 3BR



0264 333830 (24 hour answerphone)

Micro Studio

22 Churchgate Street, SOHAM, Ely, Cambs. CB7 5DS. Tel.(0353)720433

MAPS OF THE WORLD

GRAPHICS LIBRARY PACK FOR THE ARCHIMEDES

Includes

Austria, Belgium,
Belize, Bulgaria,
Denmark, France,
Germany, Greece,
Holland, Iceland,
Ireland, Japan,
Mexico,



Includes

New Zealand, Peru,
Poland, Portugal,
Scandinavia, Spain,
Switzerland, USSR,
Yugoslavia.

Over 100 in total

PRICE
£29.95
Inc.vat &
carriage



DTP GRAPHICS LIBRARY PACKS

MONO £17.25 COLOUR £19.95

DUAL PACK

MONO & COLOUR TOGETHER
£29.95

SPECIAL OFFER

IMPRESSION £149 inc

including MAPS or DUAL
pack FREE please specify



B&S COMPUTING (Nottm) Ltd.



258 Derby Road, Bramcote, Nottingham NG9 3JN
Telephone: (0602) 491202 Fax: (0602) 491322



ACORN APPROVED DEALER****CITIZEN SUPER DEALER****STAR REGISTERED DEALER

ARCHIMEDES COMPUTERS

(carriage free)

	Base	Mono	Colour	Multi-Sync
A3000	£649	£709	£849	£1069
A310	£899	£959	£1099	£1319
410/1	£1199	£1259	£1399	£1619
420/1	£1699	£1759	£1899	£2119
440/1	£2499	£2559	£2699	£2919
PC Emulator (with system)				£99
A3000 Monitor Plinth (with every system)				£29

OFFER 1

Buy your Archimedes on 0% finance. Please phone or write for full details.

or OFFER 2

Buy your Archimedes on **Low Cost** finance over 24 months at a flat rate of just 5% per annum (Typical APR 10.5%)

or OFFER 3

We will allow you 10% of the purchase price of your Archimedes towards any other Hardware or Software purchased from us at the same time.

Please note - Offers 1, 2 and 3 only apply when you purchase an Archimedes from us at the above prices.

ARCHIMEDES SOFTWARE

(carriage £1.50)

1st Word Plus		£69
System Delta Plus		£59
SigmaSheet, Gamma Plot	each	£59
Render Bender		£59
Artisan		£29
Atelier		£85
Auto Sketch		£69
ISO Pascal, Fortran 77	each	£95
Logistix		£95

(carriage £2.50)

Acorn Desk Top Publisher		£125
Ansi C (Release 3)		£125
Lisp, Assembler, Prolog X	each	£180
Pipe Dream (Version 3)		£135
Pro-Artisan		£135

ARCHIMEDES GAMES

(carriage £1.50)

Orion, Missile Command	each	£12
Freddys Folly, Alerion	each	£12
Jet Fighters, Hover Bod	each	£12
Word-up-Word Down		£15
Zarch, Repton 3 Ibox The Viking, Pacmania, Terramex	each	£15

ARCHIMEDES EXPANSIONS

(carriage £1.50)

1 Mb RAM Upgrade (A3000)	£199
1 Mb RAM Upgrade (400/1 Series)	£199
A3000 Serial Port Upgrade	£19
A3000 User/Midi Port Upgrade	£49
(carriage £6.00)	
2nd 3.5" Drive (305 & 310)	£115
2nd 3.5" Drive (400/1 series)	£125

PRINTERS

(carriage £6.00)

Free printer lead and paper with all printers purchased (Please State Machine)

Citizen	
120D	£124
Swift 24	£269
The Star 'Business Series'	
LC10	£139
LC10 Colour	£179
LC10-II	£159
LC15	£279
LC24-10	£229
LC24-15	£349

The Star 'Professional Series'

FR10	£339
FR15	£439
XB24-10	£439
XB24-15	£579
FR/XB Colour Upgrade	£39

The Star 'Laser Series'

Laser 8	£1395
Laser 8 DB	£1895

The Star Professional Series and Laser Series come complete with one years on site warranty.

We stock an extensive range of ribbons and paper - Please phone us for details.

We often have available refurbished BBC Model B, B+, Master 128's and associated peripherals. Please phone our sales staff for full details and prices.

UK CUSTOMER: Please add 15% VAT to all prices (INCLUDING CARRIAGE)

Government department and educational establishments official orders welcomed.

All Prices are correct at time of going to press and are subject to availability. Finance is subject to status. B&S Computing (Nottm) Ltd. are licensed credit brokers. Full written details are available on request.

BBC MASTER 128

(carriage £6.00)

Master 128 complete with View 3, View Sheet, DFS, ADFS, BASIC, The BASIC Editor and Terminal £395
Master 65C102 Co-Processor £115
Take advantage of our system prices which enable you to obtain a complete system at a reduced price. Please telephone us for full details.

MONITORS

(carriage £6.00)

Philips CM8833 (Colour)	£199
Taxan 770+ (Multi Sync)	£490
Philips BM7502 (Green mono)	£64

DISC DRIVES double sided 40/80T

(carriage £6.00)

Without Power Supply	
Single drive 5.25"	£90
Dual drive 5.25"	£180
With Power Supply	
Single drive 5.25"	£105
Dual drive 5.25"	£195
Dual drive in plinth 5.25"	£229

(carriage £1.50)

Acorn 1772 DFS kit (for BBC B)	£45
Acorn ADFS ROM (B+/B with 1770)	£25

DISCS AND DISC BOXES

(carriage £1.50)

B&S 5.25" 96 tpi Double sided	£10
B&S 3.5" 135 tpi Double sided	£13

(B&S Branded discs are supplied in plastic library cases)

40 disc lockable box (3.5")	£7
50 disc lockable box (5.25")	£7
80 disc lockable box (3.5")	£9
100 disc lockable box (5.25")	£9

THIS ADVERT ONLY SHOWS A PART OF OUR EXTENSIVE RANGE. TO RECEIVE OUR CURRENT CATALOGUE OR DETAILS OF FINANCE, PACKAGES Etc, PLEASE RETURN THIS COUPON.

Name

Address

.....

.....

.....

Catalogue ☐ Finance ☐
Archimedes ☐ Master ☐

Available now!

Genesis

Hypermedia for Archimedes!

Genesis provides a framework for creating and accessing linked pages of information. Many types of data can be displayed on Genesis pages including:

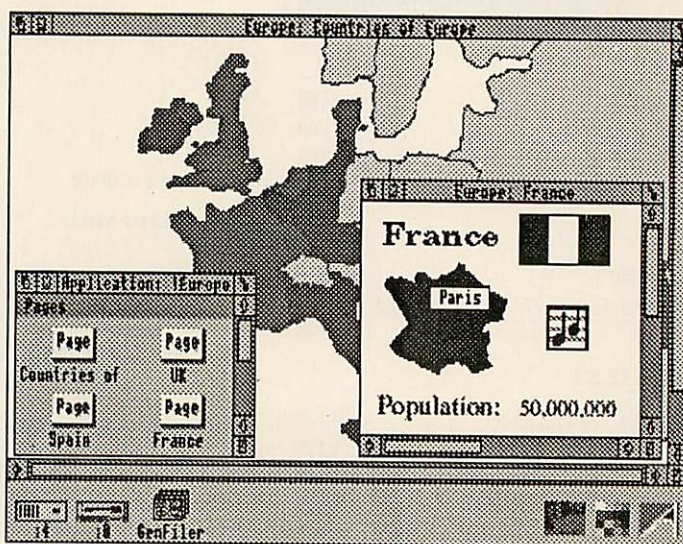
- ☐ text in many fonts, sizes and colours
- ☐ sprites from painting packages or digitizers
- ☐ object oriented graphics from Draw, Presenter 2 and other packages
- ☐ 3D pictures from Euclid which can be viewed from any position
- ☐ animated films from Mogul
- ☐ music from Maestro, including support for MIDI

NB Genesis does NOT need Euclid, Mogul or Maestro to be running in order to handle their data

Genesis can be used for creating information resources which can be updated as appropriate.

Genesis supports many of the requirements of the National Curriculum for retrieving, developing and organising previously stored information as well as amending and adding to this information.

Genesis provides an ideal tool for creating reports and presentations with hard copy available via the standard RISC OS printer drivers.



Price excl VAT:	£86.95	£69.95 (ed)
Site licence:	£347.80	£279.80 (ed)



Broadway House, 149-151 St Neots Road
 Hardwick, Cambridge CB3 7QJ
 0954 211760 Telecom Gold 74: YKK255



ON LINE FANTASY

In the days of yore, when people thought 1200/75 baud comms was fast, bulletin boards tended to be used by people who wished to talk about computers and nothing else.

Time has moved on and throughout the country there are informal 'networks' of bulletin boards which cater for different needs. One such network mentioned in this column before is the Channel-X network. This specialises in computer music.

A letter from Peter Wainwright, who uses the name Pandrogas (please don't laugh!) informs me that the Shatternet network specialises in science fiction and fantasy.

Pete, er... Pandrogas, runs a BB in Northampton called Darkhaven Castle. The board is used as the HQ for the Shatternet network which consists of 17 boards, three of which are currently off line.

The majority of the boards are run on BBC B or Master 128's using the CARBBS BB software created by Chris Royle of the Sin Bin. Most provide scrolling and viewdata access, and a network mailing system is currently being developed.

The network also provides a fair bit of support for the Archimedes and Darkhaven Castle



Even I must admit that comms can be boring now and then. If you're thinking of a career in comms, think again. I mean, look at the bods above. They look bored stiff operating an on-line system. The one on the left is scratching his face, and the dude second from left has resorted to picking his nose! As for the other three suit-types, I know a promotional job when I see one.

features a news bulletin for both the Beeb and Arc.

WINNER

Remember the competition I set in the March issue? The idea was to submit a caption to the picture on the right.

At least a dozen of you sent in suggestions. A few were naff, a couple were imaginative and some were downright sexist (E Wayers take note). After much deliberation I decided that M T Gibbs of Kempston, Beds is the



winner with 'No officer, it's not a carphone. It's Victor Kiam's new gadget for removing hair from my ears.' The editor liked that one as he's got the very same gizmo!

A copy of *The Complete Computer Virus* handbook is on its way - congratulations!

BAD NEWS

Last month in News In Brief I reported that Michael Colvin, Tory MP for Romsey and Waterside, had submitted a Private Member's Bill proposing tough sentences for computer hackers.

The bad news is that the Bill got a second reading in the Commons, and it looks like it could become law!

More news next month but in the meantime protest to your MPs (as well as Colvin) and tell them why such a bill is ridiculous.

David Janda

NEWS IN BRIEF

A number of BB operators have asked if they can set up a *BBC Acorn User* area on their BB in which they would provide program listings from the magazine.

Sorry folks but no can do. All *BAU* programs are copyright unless (occasionally) stated otherwise. Also, as well as yellow pages, *BAU* programs are sold on disc.

● **Dialcom** is no more. No, not the company which operates services such as Prestel, Telecom Gold and PSS, but the name. For some silly legal reason us hacks must use 'a service from British Telecom' instead. Dialcom House, in Hemel Hempstead (aka *The Twilight Zone*) has been renamed **Network House**.

● I have mentioned the Kermit file transfer protocol in these pages a few times and a number of you would like to know where you can get it from.

Acorn has a version for the Arc and Beeb owners can obtain an excellent version from the public domain library at Lancaster University. To access, call the university computer on (0524) 67671 (various speeds). Enter **CALL LANC.PDSOFT** at the chevron. Then enter (in lower case) *pdsoft* when asked for sign-on and password.

● **Microlink** on the Istel network has launched **Bloodstone**, a long-awaited multi-user game.

It's free to peak time players and 3p per minute off-peak. For more info contact Microlink on (0527) 28515 ext 2697.

If you have any comms news please send it to David Janda at BBC Acorn User or contact him on Telecom Gold 81:RED001 or via Prestel 919992492.

NAME	NUMBER	TYPE	TIMES
Darkhaven Castle	(0604) 413716	BOTH	24HR *
Greystar Isle	(0387) 51737	BOTH	24HR *
TAS/Diamond Plateau	(0372) 743809	BOTH	24HR *
The Owl Service	(0532) 605876	SCROL	24HR
Blackstone Keep	(0727) 56939	VDATA	OFF-LINE *
Sin Bin/?	(0532) 661536	BOTH	24HR *
Xoth (Chton's Lair)	(0532) 483563	VDATA	OFF-LINE *
Byte Back!	01-959 8105	SCROL	24HR *
Transylvania Expr.	(0274) 621668	SCROL	24HR
Optix/Tamboryon	(0482) 872294	SCROL	OFF-LINE
Resolve	(0582) 832653	BOTH	24HR *
Phase II	01-330 7738	VDATA	24HR *
The Red Dwarf	(0604) 705744	SCROL	24HR
Beyond Belief	(0642) 787898	VDATA	24HR *
Swafax 2000	(0622) 850788	VDATA	24HR *
Cyclone	(0603) 260973	BOTH	24HR *

* BBC model B or Master 128 systems

Why not give one of the Shatternet boards a call?

Computerware

☎ Phone for special prices
on complete systems!

Archimedes 410

Archimedes 410/1	£1199
1Mb RAM for 410	£69
3Mb RAM for 410	£199
20Mb hard drive (fast)	£199
40Mb hard drive (fast)	£349
50Mb hard drive (fast)	£479
SCSI card (Acorn)	£269
SCSI card (CW)	£169
Floating point unit	£529
Midi card	£65

Archimedes 3000

Archimedes 3000 base unit	£599
A3000 + colour + plinth	£779
1Mb RAM expansion	£139
3Mb RAM expansion	£399
20Mb hard disk (CW)	£399
Plinth (PRES)	£24
Serial upgrade	£19
User & Midi podule	£46
Floppy disk buffer	£26
Internal SCSI card	£169
external SCSI podule	£169
Colour Modulator	£26

Extras

Mouse mat	£5
Keyboard cable extender	£6
Printer lead	£8
Floppy discs (10boxed, TDK)	£14

Monitors

Acorn Colour	£199
Philips Colour	£180
Eizo 9060-SZ multiscan	£465

Books (no VAT)

Acorn PRM	£79
C: A Dabhand Guide	£14
Archimedes Assembly Language ...	£14
BBC Basic Guide (Acorn)	£19

Upgrades

Aleph One ARM3 30MHz	£579
MEMC1a	£50
Atomwide APEC	£33
Atomwide VIDC enhancer	£26
Acorn I/O v2	£80
Acorn FPU	£529
A410/1 replacement floppy drive	£69
A300 replacement floppy drive	£69
Floppy disk Buffer	£26
20Mb hard drive (fast) for 300	£369
40Mb hard drive (fast) for 300	£499
45Mb SCSI drive only (18ms)	£499
75Mb SCSI drive only (18ms)	£599
105Mb SCSI drive only (18ms)	£749
210Mb SCSI drive only (18ms)	£1149
External casing for above add	£60
SCSI podule bought with drive add	£49
1Mb RAM for A310	£345
3Mb RAM for A310	£520

Printers

Panasonic KXP4450i laser	£1345
Panasonic KXP 1124	£249
Star LC10	£159
Star LC2410	£259
Printer Lead	£8

Archimedes Software

Acorn DTP	£119
Impressions (CC)	£139
Pipedream 3	£129
ANSI C v3	£139
ISO Pascal	£139
PC emulator	£99
First Word Plus	£69
C-Front	£17
Disc-Tree	£39
Pro-Artisan	£89
Artisan 2	£49
Render Bender	£59
Interdictor	£28
Twin editor	£27

Computerware Research Ltd.

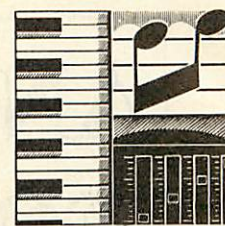
9-11 Livestock Market
Hall Road
Norwich
Norfolk
NR4 6DW
0603-507799
fax: 0603-507789

Terms & Conditions

Payment may be cash, cheque, credit card (VISA / ACCESS), bullion, US dollars. Goods are **delivered free of charge** via mail or courier depending on size. UK customers **please add 15% VAT**. Export no VAT, carriage at cost. Personal callers welcome.

Specifications / price subject to change without prior notice. Goods available subject to stock levels.

Please note:
Prices exclude VAT @15%
Delivery in the UK free.



ON THE CREST OF A WAVE

As promised in the last Music column, you'll find a short program in this month's yellow pages which plays samples through Hybrid Technology's Music 5000.

The program accesses the DAC (Digital to Analogue Converter) directly so it's not even essential to have the Ample Nucleus Rom in your computer.

The program generates a variety of waveforms by calculation and sends them to the DAC. What would be even more interesting, however, would be the ability to load and play 'proper' samples.

The problem here is getting samples into memory in the first place as I am not aware of any sampler programs for the BBC micro. But if you have an Archimedes, a Beeb and suitable communication software, you should be able to transfer sample data from the Arc to the Beeb.

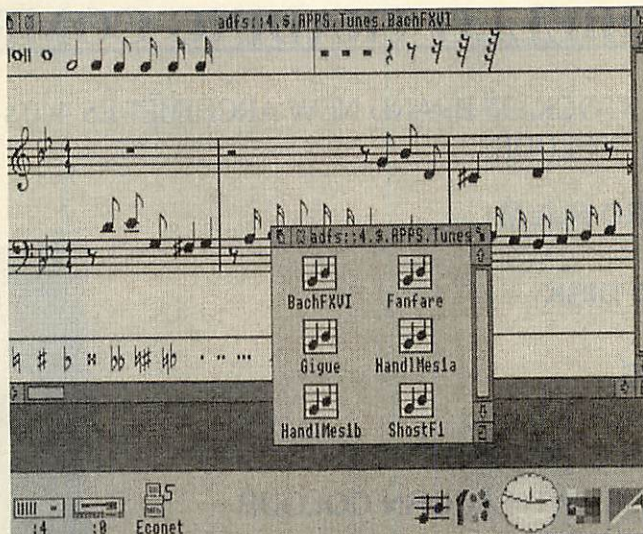
This is something I haven't tried yet, but if any enterprising reader wants to pursue this avenue of exploration, let us know your results – good or bad.

Samples give us more realistic sounds than most forms of synthesis. One of the most critical factors in achieving this realism is the initial attack portion of the sound.

This is why many modern forms of synthesis (such as Roland's LA synthesis used in its D-50, MT-32 and D-110 synthesisers) use a sampled waveform of the attack portion of a sound followed by a synthesised waveform for the body of the sound.

We can demonstrate the importance of the initial attack period with the Hybrid Music System as some of the waveforms it uses are pseudo samples. GET the Vibglock sound into Notepad.

The attack is provided on channel two by the high wave-



Maestro, the music program that comes as standard with Risc OS, makes getting to know MIDI on the Arc easy – and cheap.

form. Reduce its AMP to 0 (press f1 then RETURN) to hear the sound without it – interesting, eh? If you like experimenting with waveforms, Amplinux disc 14 contains a utility which lets you redefine any or all of the Music 5000's waveforms.

If you're not an Amplinux member, send a fiver plus a formatted disc and an SAE to Amplinux, 26 Arbor Lane, Winkers, Berks, RG11 5JD.

MAESTRO AND MIDI

Did you know *Maestro*, the music program supplied with Risc OS, is MIDI-compatible? If you have a MIDI interface, when you access the Instruments menu in *Maestro*, you will see a fourth column labelled MIDI.

The program interrogates your system and the MIDI column only appears if a MIDI interface is present.

That makes *Maestro* the cheapest introduction to MIDI on the Arc – free! All you need is the interface.

Maestro's MIDI parameters are used to select which MIDI channels the eight voices will transmit on.

You need a multi-timbral instrument (one which can play different music lines using different sounds) to take full advantage of this.

Most modern synths and expanders are multi-timbral.

If you have a MIDI podule, enter Command Line mode by pressing f12 and type *HELP MIDI; you will see a list of MIDI commands.

The MidiSound channels MIDI data to the internal voices and specifies the MIDI port, MidiTouch enables and disables velocity data, MidiChannel sets the MIDI channel 1-16, MidiMode selects MIDI mode 1-4 and MidiStart, MidiContinue and MidiStop control the transmission of MIDI clock messages for controlling drum machines and sequencers.

This also shows the version number of the MIDI podule software (to work with the forthcoming *Inspiration* you need version 3.14 or later).

I haven't seen these commands fully documented anywhere but entering *HELP <command> gives more information which will be self-explanatory if you know a little about MIDI.

Ian Waugh

NEWS IN BRIEF

● At last. *Inspiration*, the professional MIDI sequencing program for the Arc, is finished and due to be launched on 1st March at £399 plus VAT.

A demo disc is available from Pandora. Send a formatted disc plus a stamped, addressed padded bag. You don't need a MIDI interface to run the demo.

Pandora is due to launch the PM4 professional MIDI Interface, which is compatible with the A3000, at the same time.

Further details from Pandora Technology, 9 St Marks Place, London, W11 1NS. Tel: 01-221 9653.

● Archimedes music specialist, Ampsound, has developed a 1Mb expansion card for the A3000.

Normal retail price is £172.50 but you can save £45 by buying an A3000 plus the board for £874. Ampsound, 153a Victoria Street, St Albans, Herts, AL1 3TA. Tel: (0727) 50075.

● NCET has produced a version of *Touching Sound*, which runs on the Hybrid Music System without the copyright problems which have delayed its release so far. It's priced at £15.

Telephone (0203) 416994 for details.

● Schools with B, B+ and Master computers will be interested in *Opus* from the Advisory Unit. The package is designed for introducing and exploring the way music is put together. *Opus* costs £15 from the Advisory Unit, Endymion Road, Hatfield, Herts AL10 8AU.

● If you have any music news or tips you'd like to share or if there are any topics you'd like to see covered in this column please write to Ian Waugh at BBC Acorn User, 20-26 Brunswick Place, London N1 6DJ.

AN ARCHIMEDES 440 FOR ONLY £1499.00?!

PORTOBELLO TRADING COMPANY

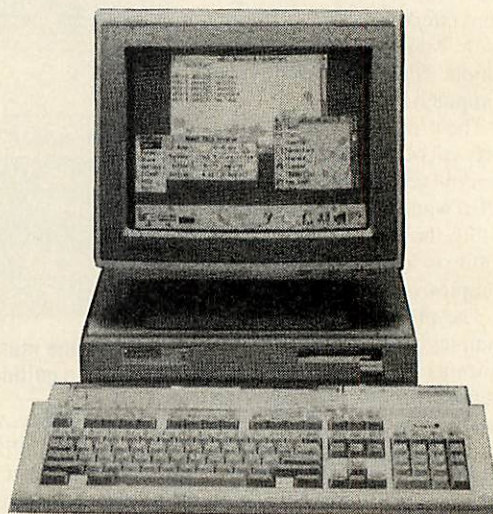
HAVE A VERY LIMITED STOCK OF BRAND NEW ARCHIMEDES 440's FOR SALE.
SPECIFICATION INCLUDES:

4 MB ON BOARD R.A.M

20MB HARD DISK

RISC OS.

PRICED AT **£1499.00** EX. VAT FOR THE BASE UNIT
OR **£1649.00** EX. VAT WITH ACORN COLOUR
MONITOR OR **£1699.00** EX VAT WITH THE PHILIPS
8833 MONITOR



ALL THE ABOVE GOODS CARRY A FULL YEARS
WARRANTY.

DELIVERY IS £15.00 NEXT DAY, ANYWHERE IN THE UK

**THIS IS A VERY LIMITED OFFER AND ALL ORDERS WILL BE TREATED ON A
FIRST COME FIRST SERVED BASIS.**

AUTHORISED ACORN DEALER

FOR MORE DETAILS OR TO PLACE AN ORDER CONTACT US AT:

**298-302 PORTOBELLO HIGH STREET
EDINBURGH EH15 2AS**

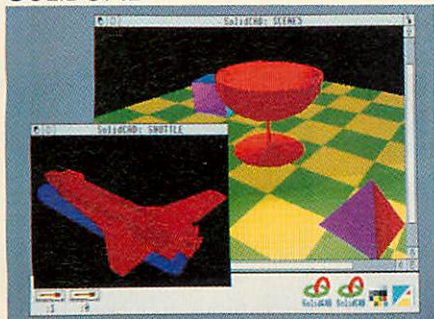
TEL: (031) 657 3941 FAX: (031) 657 2988



SILICON VISION

SOFTWARE FOR THE ARCHIMEDES COMPUTER SYSTEM

SOLIDCAD



The next generation multi-tasking CAD package combining 2D Draughting and 3D Modelling techniques with advanced smooth shading and lighting effects to provide the ultimate 3D Draughting System for Architectural design, Interior design, Engineering design and Teaching CDT. Allows drawing in plan, front & side elevations and also directly in 3D to visualise a model while it is being created. Powerful zoom, pan, sweep, extrude and macro facilities are also provided to enhance design productivity.

£99.95 (ARC) **New**

SOLDSRENDER

The most advanced Ray Tracing package for the Archimedes producing photo-realistic images of SolidCAD designs or FILM-Maker animations taking into account multiple light sources, reflections, shadows, transparencies, refractions and textures for the highest quality pictures from the leading 3D graphics experts renowned for technical excellence. The high-speed ray tracer uses sophisticated colour mixing techniques to provide the maximum range of colour shades plus anti-aliasing for smooth edges, motion blur effects, dynamic viewpoint, variable camera lens for wide angle and telephoto effects and multi-colour light sources driving the Archimedes display hardware to its limits for the best photo-realistic images within the laws of optical physics.

£79.95 (ARC) **New**

SOLIDTOOLS

The fully integrated environment for 3D CAD, Animation, Rendering & Hardcopy. The package includes SolidCAD, FILM-Maker, SolidsRENDER, Realtime Graphics Language, SuperDump & SuperPlot for a turnkey solution satisfying all your 3D Design and Presentation requirements.

£275.00 (ARC) **New**

RiscBASIC



The best BASIC V compiler money can buy. Here's what the reviewers say:

"If you are looking for THE compiler to go for, and are confused about which one deserves to win the very public battle that has been raging in the advertisements, well my preference is for RiscBASIC"

- RISC USER August 1989.

"In summary, BASIC V is the best version of BASIC produced and RiscBASIC provides the most compatible, fastest compiler for this language. This will be an invaluable addition to every serious BASIC programmer's toolkit. My congratulations to Silicon Vision"

- Archive June 1989.

"very useful indeed for development work...produced significantly more efficient code"

- Micro User July 1989.

"RiscBASIC wins the race...has the edge overall...more likely to provide the correct results"

- BBC Acorn User Nov 1989.

"Still the only true BASIC V syntax compiler. If you want the best, buy Silicon Vision's complete answer"

- Micronet August 1989.

£99.95 (ARC) **New**

GERBERPLOT

The complete Gerber driver for ARC-PCB and ARC-PCB Professional Printed Circuit Board design packages producing Gerber plotfiles for driving Electro-static Photo-plotters. These plotfiles may be sent directly to photoplotter bureaus on Archimedes ADFS or MSDOS disc formats to produce the highest quality PCB artwork for professional results.

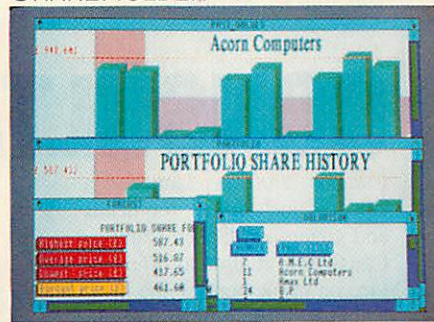
£125.00 (ARC) **New**

SUPERPLOT

The complete plotter driver for SolidCAD, Realtime Solids Modeller and Gate-Array Design System supporting the industry standard HP-GL, Graphtec, Watanabe and Plotmate plotters.

£29.95 (ARC) **New**

SHAREHOLDER



The complete share holder's management system providing all the facilities needed to automate your portfolio. Features include Company statistics, Share holdings, Transaction processing, Portfolio history, Forecasts, Dividends due, Share price updates plus built-in Calendar, Calculator and Hardcopy facilities for total integration.

£99.95 (ARC) **New**

DATAVISION

A full featured relational database management system which also includes word processing, label printing, reporting, & mail-merging facilities in one integrated environment for the Archimedes, bringing professional quality business software to the demanding user. The database manager is rich in features and includes facilities for the production of complex queries, detailed reports, browsing, sophisticated relational data entry, relational reporting, interactive & global editing, formula entry and validation. All this in an intuitive easy to use mouse driven environment.

£99.95 (ARC) **New**

FINANCIAL ACCOUNTANT

The professional business accounting and database package which includes DATAVISION together with turnkey applications for Order Processing, Invoicing, Sales ledger, Purchase ledger, Cash book, Stock management, Reporting, VAT returns plus year-end accounting complete in one integrated environment.

£175.00 (ARC) **New**

OFFICE TOOLS

The complete Office Automation system for Database management, Mail merging, Wordprocessing, Label printing, Order Processing, Invoicing, Accounting, Share portfolio, Forecasting, Dividends processing, Calendar, Calculator and Presentation graphics. Includes Financial Accountant, DataVision, ShareHolder, and the Presentation System providing a turnkey solution for all your business and management requirements.

£295.00 (ARC) **New**

All software run in native mode on A300-400 Series & A3000 with RISC OS. Enquire for our free product Catalogue

SILICON VISION LTD, SIGNAL HOUSE, LYON ROAD, HARROW

MIDDLESEX HA1 2AG. TEL: 01-422 2274 or 01-861 2173

FAX: 01-427 5169. TELEX: 918266 SIGNAL G.



(Access/Mastercard/Eurocard/American Express accepted)

All prices include VAT and Carriage (Overseas orders should add £4)



CONSULTANT ON CALL

Campus 2000 has launched a new on-line service for heads and governors. Called Campus Consultant, it aims to offer advice on implementing the Education Reform Act, in particular LMS.

Regularly updated and managed by Innovations International, a team of educationalists headed up by Kingshurst CTC principal Valerie Bragg, Campus Consultant will also provide a confidential consultancy service for answering personal queries on management issues. All questions, submitted, of course, via electronic mail, will receive a reply within 48 hours.

Innovations International is fielding an impressive array of experts but as some of the answers it will be giving will hinge on interpretation of the law, it has taken out substantial indemnity insurance.

Subscribers will also be able to use the system's conferencing facilities to discuss mutual problems. They will also have access to summaries of key DES circulars and case studies.

The cost of a subscription will be £150, which buys unlimited use of the Campus Consultant information services plus a thousand 'question units'. It's estimated that an average question will 'cost' 25 units.

Further information about Campus Consultant is available from Campus 2000, PO Box 7, 214 Gray's Inn Road, London WC1X 8EZ.

PRE-EMPTED

On show for the first time at the Archimedes Spring Fair in March, was the *Pre-Emptor* system, from a new company called, well, Pre-Emptor.

Company founder Brian Wright has spent 10 years researching and developing the software which, if it does as much as it appears to on a brief demonstration, could be an extremely powerful classroom and teaching aid.



How does she manage it? Valerie Bragg combines her duties at Birmingham's Kingshurst CTC with directing educational consultancy Innovations International, the company running Campus Consultant. Herself a shining example of 'coping' with the new service she may be able to help fellow heads handle the current educational reforms and avoid nervous breakdowns.

Designed, as the slogan says, to 'free you to teach', the system has three basic aspects: assignment generation, record-keeping and report writing.

Teachers enter their pupils' details and assess their abilities. The program will then create worksheets for a variety of projects, specially tailored to meet individual pupils' needs and closely related to National Curriculum attainment targets.

The teacher enters students' marks perhaps once a month and at more or less the touch of a button can print out formative, summative or parental reports.

At present the attainment target modules all relate to the science National Curriculum, but Brian already has specialists working on modules for other subject areas and primary level.

The framework package costs £99.95 and each module is £24.95. Initial topics include the nature of science, sound and music and electromagnetic radiation. It runs best on the Arc but a version is also available for the BBC.

Mr Williams, network manager at Clapton School in east London and a visitor to the

Spring Fair, was the lucky winner of a complete *Pre-Emptor* system plus attainment module of his choice.

Brian Wright can be contacted at Pre-Emptor, 2 Lockyer Road, Mannamead, Plymouth.

PRIMARY CASH BONUS

Schools minister Alan Howarth has promised extra DES money for hardware in primary schools.

Speaking at the annual conference of the National Association of Advisers for Computers in Education (NAACE) in Dorset, Mr Howarth said, 'I am very pleased to announce an addition of £4 million of supported expenditure to this year's Education Support Grant programme of IT in schools. The extra grant is exclusively for the purchase of microcomputers for primary schools.'

He said that the UK leads the world on IT in schools and thanked LEAs and teachers for helping to achieve this. According to official DES statistics there are on average three micros in every primary school (1:67 students) and 30 in every secondary school (1:28).

Lisa Hughes

NEWS IN BRIEF

● Glasgow-based publisher Scetlander has announced cuts in the educational prices of some of its most popular packages. *Add/Sub Maths* and *Holiday* are both down to £15 from £25 and £18.50 respectively, while *Colour* is reduced from £15 to £7.50. All three are for BBC machines.

The company has also published its new catalogue which contains details of 56 programs covering a wide range of subjects and ability levels. The catalogue is free from Scetlander Ltd, 74 Victoria Crescent Road, Glasgow G12 9JN.

● There are now just over 200 advisory teachers registered with Sherston Software's service for advisory teachers.

Under the scheme advisory teachers can have up to 10 titles on extended loan for use in their work with schools. They then have the option of a 50 per cent discount on any packages purchased for demonstration purposes.

Sherston will also make bulk loans for courses and INSET days.

Anyone interested in joining the scheme should contact Gill Sparrow at Sherston Software, Swan Barton, Sherston, Malmesbury, Wiltshire SN16 0LH.

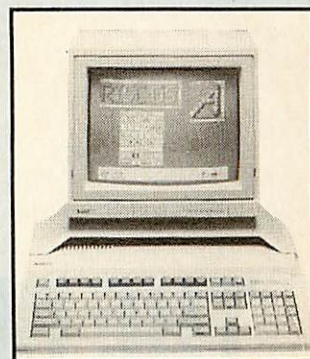
● Mercury Educational, which handles ITV Schools' products, has a series of cross-curricular packs featuring five new pieces of software and called IT.

Programs include a spreadsheet, a desktop publisher, a profiling and matching program, an accounts package and a bookings and reservations program.

Mercury has an up-to-date catalogue available from 8-10 Lower James Street, London W1R 3PL.

New
from
Acorn

THE LEARNING CURVE



THE LEARNING CURVE

NEW - FROM ACORN

It consists of:

- An A3000 Computer
- The new faster PC Emulator
- First Word Plus v2 Word Processor
- Genesis Information System
- A Video explaining how to use the package
- Information on the National Curriculum

Save Over £240

The free software bundled with this package is worth £300, and yet the entire system costs only £57.50 more than the standard A3000.

Ideal For Home & Education

This system is tailor-made for the home user with children. The A3000 and other Archimedes systems are increasingly used in schools and this all-inclusive package with the excellent Genesis software will supplement Information Technology in the National Curriculum.

Just Right for Home & Business

A Word Processor is essential in all home systems, and 1st Word Plus with its built-in spelling checker is excellent. The new PC Emulator also means that over 95% of PC software (Dbase, Lotus, Wordstar etc.) will run on the A3000 straight away.

RISC User

RISC User is the world's largest Archimedes Support Group, and publishes the leading magazine devoted exclusively to the A3000 and Archimedes. An annual subscription is £16.90 (UK) and carries a multitude of benefits, including FREE technical support and discounts.

SPECIAL OFFERS FOR RISC USER MEMBERS

0% Finance

We are able to offer RISC User members 0% finance over 9 months, for example:

	COST	DEPOSIT	BALANCE	MONTHLY PAYMENTS
Learning Curve Computer only	£803.85	£83.85	£720	£80
Learning Curve Comp + Colour Monitor	£1021.20	£121.20	£900	£100

OR: ARTISAN II, PRINTER LEAD, E-TYPE GAME, DUST COVER

Learning Curve Computers are in short supply - order yours now and we will supply on a first-come first-served basis. BE ONE OF THE FIRST IN THE COUNTRY WITH THIS SUPERB SYSTEM.

ORDER FORM

- Please supply: ☐ Learning Curve Computer Only (£803.85)
☐ Learning Curve Colour System (£1021.20)
☐ Information about the Learning Curve System
☐ A RISC User Subscription (£16.90 UK)
☐ 0% Finance application form for: the Computer only
☐ the Colour System

I enclose a cheque for £_____ (Please add £7 for courier delivery)

Or: Please debit my Access/Visa/Connect Card No _____/_____/_____/_____/_____/_____

Card Expiry Date ____/____/____ Signature _____

Name _____ RISC User/BEEBUG Memb No: _____

Address _____

Post Code _____

HOW TO FIND BEEBUG

BY CAR

St Albans is easily reached from A1, A5, A6, M1 and M25

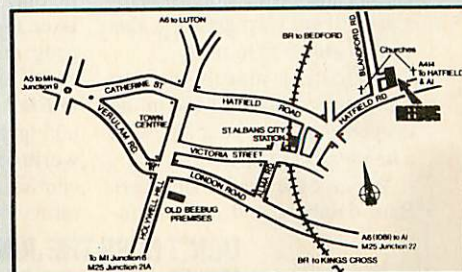
BY TRAIN

We are 10 minutes walk from St Albans City Station on the King's Cross to Bedford line.

Office Hours 9am - 5pm Mon - Fri

Showroom Hours 9am - 5:30pm Mon - Sat

Showroom is open until 8pm on Thursdays.

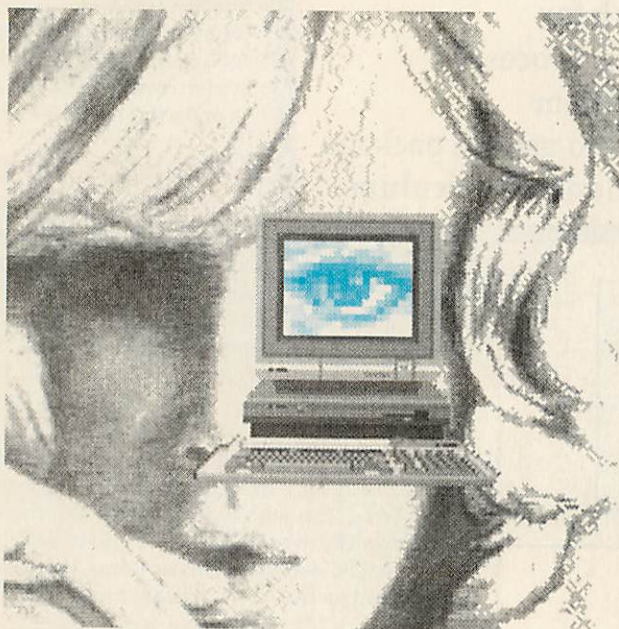


If you would like a leaflet on the Learning Curve Computer System write to:

BEEBUG Ltd 117 Hatfield Road, St Albans, Herts AL1 4JS or Phone 0727 40303 or FAX 0727 60263

NEXT MONTH Coming soon to BAU...

THE RIGHT IMAGE



In the June issue of *BBC Acorn User*, you will have the chance to win Acorn's complete new home learning system, The Learning Curve. See the exclusive report on page 7.

You can also read what Acorn's plans for IT in education are... plus what some schools are doing with simulation software.

The issue also sees the start of a major new series on image generation and manipulation.

If you've ever wanted to get your computer to analyse a video picture or you've always wanted to create those wacky effects the professionals manage, on your own artwork, this series is the one to read.

Also next month, we go searching for the lost file in the deepest depths of your Arc with a handy disc manager.

We give the Beeb a sideways Ram database and take an in-

depth look at Roman numerals. Plus we examine the impressive *Genesis* hypermedia program, Sherston's newsroom simulation for the Beeb, the innovative *Arcol* graphics package, Qume's new WP+laser printer, the long-standing *Pixel Perfect* Arc DTP software. Plus what you can add to your Archimedes for next to nothing.

And the June issue sees the start of a brand new regular column for users of the Master 512 and the Archimedes PC emulator.

Plus there's all the usual favourites to pack the June issue to the gills with advice, programs and features for every Acorn user.

● *BBC Acorn User* will be taking a special look at the world of 8-bit machines in the coming months. Watch out for more details.

DON'T MISS THE JUNE ISSUE - OUT 10th MAY

Archimedes upgrades

Memory

Extra 1Mb for A3000 (2Mb total)	£109.95
1Mb RAM for 410/1 (2Mb total)	£93
3Mb RAM for 410/1 (4Mb total)	£264
2Mb RAM for 420/1 (4Mb total)	£180
1Mb RAM for A310 (2Mb total)	£302
3Mb RAM for A310 (4Mb total)	£482
45Mb internal SCSI hard disc + podule	£535
70Mb internal SCSI hard disc + podule	£899
MEMC 1A	£59
Impression (Computer Concepts)	£148
Acorn DTP	£143
Pipedream 3 (Colton)	£140
MultiStore (Minerva)	£230
ARM3 (30MHz)	£570
A3000 with 2Mb RAM	£746
Programmer's Reference Manual	£75

Prices include VAT. Write or phone for our free price list.

4-slot backplane for 300 series

Still the no. 1 backplane for the A305 & A310. Four-layer circuit board gives superior performance by reducing electrical noise. Recommended for all hard disc upgrades, particularly SCSI. Complete with fan and all metalwork. £69.95 inc. VAT.

"...we are pleased to report that the IFEL backplane is of a very high standard". Beebug Retail Catalogue.



Order with Access or Visa on (0752) 847286

IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD (0752) 847286

Uvipac Eeprom Eraser



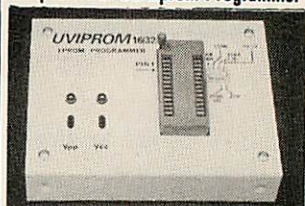
The UVIPAC was designed especially for the home computer enthusiast requiring to erase up to 3 EPROMs at a time. Also erases Datapaks.

- ★ Compact 90 x 80 x 40mm size.
- ★ 240 volt mains powered.
- ★ 15 minute timer option in (T) model.
- ★ Spare tubes only £5.00.

UVIPAC
£21.50

UVIPAC (T)
£26.50

Uviprom 16/32 Eeprom Programmer



Uviprom 16/32 Eeprom Programmer

- ★ Programs 2764, 27128 & 27256, including "A" & CMOS types.
- ★ Plugs into user port on BBC B, 128 or Master.
- ★ High Quality ZIF socket.
- ★ 21 or 12.5 Volt programming.
- ★ UVP 1.1 ROM has five * commands.
- ★ Very easy to use hardware and software.

£30.00

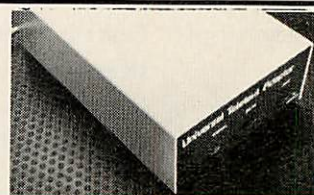
TELETEXT ADAPTER

Allows Ceefax and Oracle to be displayed on BBC B, MASTER and ARCHIMEDES (MULTITASKS with RISC-OS)

- ★ Mains powered
- ★ Auxiliary composite video and audio out
- ★ Computer controlled tuning
- ★ Supplied with software manual and datalead

BBC B etc
£50.00

ARC
£60.00



UVIPROM 16/32 SPECIAL OFFER

Save £6.50 by purchasing Uviprom 16/32 and Uviprom (T) together. Normal price £56.50

SPECIAL OFFER PRICE £50.00

EPROMS	1-2	3-9	10 up
27128A-25	£4.10	£3.90	£3.70
27256-25	£5.00	£4.90	£4.80

Only brand new devices supplied
All types use 12.5 Volt Vpp
S.A.E for old UVIPROM 21 to 12.5 data

Ground Control
TEL: 0702 230324

DEPT AU5
GROUND CONTROL
ALFREDA AVENUE
HULLBRIDGE
ESSEX SS5 6LT

ALL PRICES INCLUDE
VAT AND P&P
MAIL/TELEPHONE ORDERS
ONLY PLEASE.
EDUCATIONAL AND
GOVERNMENT ORDERS
WELCOME.



ASSAULT AND BATTERY

I feel it necessary to comment on the 'Master Battery Tip' in Eight Bits in the April issue.

Under no circumstances does Acorn recommend replacing the Master 128 battery pack by individual cells, even with a diode. The complete pack should be replaced by the Acorn spare, ADT16, available from dealers.

The use of the correct spare avoids the risk of batteries receiving a charging current from the computer.

David Bell

Acorn Computers

While we wholeheartedly agree that any readers not 100 per cent sure what they are doing should not attempt replacing the 'official' battery pack, the Acorn ADT16 battery pack is just individual cells and a diode as specified in the published tip.

Perhaps Acorn could look at supplying a battery pack made up from a battery holder as suggested in the published tip so Master owners could simply slip in new batteries when necessary, for about £2 a time.



A SCANNER CLEARLY

I read your January review of scanners and thought you might like to see what the Archimedes can really do with the right equipment — an Epson colour scanner and Kiwi software.

Lyndon McEntee
Gore, New Zealand

ENGLISH MADE EASY

I would very much like to thank C Ferrington for the brilliant printer driver for View which I now use exclusively. My Citizen LSP-10 printer is set up for Epson FX1 mode with the USA character set. I changed

'pound_char' to 35, but it was a nuisance having to change the dip-switch to English characters for wordprocessing or issuing an embedded command for every document requiring a '£' sign.

The answer was a short routine that was accessed every time the driver encountered Ascii character 96.

```

10 REM View £ code
20 REM for Epson comp
   atible printers
30 :
40 osccli=&FFF7:oswrch
   =&FFEE
50 pronly=&40D0:retur
   n=&044D
60 PROCprint_pound
70 PROCsave
80 END
90 :
100 DEF PROCprint_poun
   d
110 P%=&C6A
120 [OPT 3:LDA #27
130 JSR pronly:LDA #82
140 JSR pronly:LDA #3
150 JSR pronly:LDA #35
160 JSR oswrch:LDA #27
170 JSR pronly:LDA #82
180 JSR pronly:LDA #0
190 JSR pronly:JMP ret
   urn
200 .end_code
210 ]
220 ENDPROC
230 :
240 DEF PROCsave
250 N$="SAVE :0.!pound
   C6A"+STR$(end_code)
260 PRINT'N$':OSCLI N$

```

The code changes the printer to the English character set, prints a '£' character, then reverts the printer back to the USA character set.

When the listing is run, the code is assembled and then saved as '!pound' which should be *LOADED just before '!codes' in the !BOOT file. The main DRIVER program (listing 1) also needs line 880 changing to read JMP & 0C6A.

E Ellis

W Yorkshire

INDEXING BAU?

I am an avid reader of BBC Acorn User and regularly refer to software and hardware reviews and read the feature ar-

ticles with great interest. I am sure there are many readers like me who would welcome some form of volume index or a database to facilitate easy access to all this vital information.

Do you have any plans to provide such a service or do you know of anyone operating a scheme similar to *McHugh Enterprise Magazine Bibliography* which covers the computing press? Does this still exist?

Matthew Basford

Tunbridge Wells

A full index takes a great deal of work to compile and also takes up much needed space in the magazine.

We would therefore like to hear from anyone who has taken the time to write their own list. We're not sure if Mr McHugh still operates his service. If you're still out there Mr McHugh, please contact us and let us know!



LEST WE FORGET...

Although I am a keen reader of BAU, I still find it necessary to write to you about the ever decreasing coverage of the Electron, BBC B, Master and Compact; really anything but the Archimedes.

While I appreciate this is a new machine and probably deserves coverage, I don't think that the other machines should be ignored completely.

The advertising also seems to be going the same way, as does the news.

C Hartland-Swann

Northants

The deciding factor on Archimedes coverage is the current market, which is reflected by the advertising. We still cater for all the machines you mention.

The May issue has a

roughly half and half 8-bit/32-bit content to keep everybody happy. Last month's issue also contained an extensive feature about Electron-associated hardware and software.

The Archimedes is the new machine at the moment and we have to keep up with the times. The Beeb though has not been forgotten, and we have an extensive list of 8-bit features coming up in the following months.

PASCAL, PLEASE

I'm doing a course on computers at College, and will be learning Pascal. I would very much like to do some work on my BBC Master 128 at home. Is that possible? Are there versions of Pascal available for the Master? I don't mind upgrading if that is necessary.

A Smith

Wolverhampton

If you wish to use a BBC micro to learn Pascal you should either consider Acornsoft's ISO Pascal or Oxford Computer System's Oxford Pascal. Incidentally the BBC Rom version of ISO Pascal works fine under the Archimedes 6502 emulator.

The compilation time is, however, a little slower than on the BBC. If you have access to a BBC Master with a 80186 second processor (the 512 board) the TDI's UCSD P-Pascal or Borland's Turbo Pascal are also recommended.

I would recommend you contact Advantage at 56 Bath Road, Cheltenham, GL50 7HJ — one of the biggest and most reliable shareware companies — it will certainly have some cheap Pascal packages available. The other upgrade path is to the Archimedes or the BBC A3000.

Here you will find Acorn's ISO Pascal to be a full and extended Level 1 implementation of the language. Another possibility for the Archimedes is the recently released Cambridge Pascal from Dabs Press.

A3000
memory expansion now available
2nd Mb £172 inc VAT user fittable

C.J.E. Micro's

THE ACORN SPECIALISTS

2 & 4 MB Ram Expansion For The Archimedes 310

CJE Micro's 320/340 RAM expansion board provides the ideal upgrade path for Archimedes 310 owners. The board can be supplied with 1MB fitted giving 2MB total or 3MB fitted giving 4MB total. The 1MB board can have 2MB more RAM fitted at any time. The extra memory is functionally the same as a 400 series. Available NOW

Professional fitting is required, so collection, fitting, return of your computer and VAT is included in the price.

Upgrade 1MB to 2MB £380, 1MB to 4MB £600

Please phone to book your upgrade fitting and/or more details.

Prices include VAT

BBC A3000 NOW IN STOCK

**Phone for details of SPECIAL DEALS
on A3000 & 400 Series**

Phone/Credit Card/Official Orders/Trade and Export orders welcome.
all prices shown include VAT

*Officially approved ACORN Dealer & Service Centre.
Demonstrations available.*

**C.J.E. Micro's (Dept, AU), 78 Brighton Road
Worthing, W. Sussex BN11 2EN**

Tel: (0903) 213361 (3 lines)

New Outline Fonts for the Archimedes



- The new outline fonts are suitable for every Archimedes application incorporating the Font Manager: DTP packages, etc.
- Each font contains 215 letters and symbols: Latin 1 alphabet with DPT extensions
- All fonts are hinted
- A comprehensive manual supplied with each delivery
- Prices from £3.99 to £9.50 per font
- Special discounts for schools
- Site licences for business use

We also supply printers, computers and disc drives at extremely low prices. Probably the best printer at its price is Canon BJ-130 Bubble Jet used for this ad:

- It has a resolution of 360 by 360 dots per inch
- It takes paper up to A3 size
- And we sell it for only £529.00!

Latest: Aleph One ARM-3 available at £585.00

Prices are exclusive of VAT and delivery

Write for a free 32 page Font Catalogue to:

The Electronic Font Foundry
18 Brockenhurst Road • ASCOT SL5 9DL



**As sold out at
the BAU show!**

Art Nouveau is a 256 colour art package developed by teachers in conjunction with graphic artists. This has resulted in a comprehensive package which meets all the demands of the professional artist yet remaining easy to use. The user manual has a tutorial section which provides step by step instructions giving an excellent introduction in the world of computer graphics to users of all ages.

A real find... **Definitely recommended**

Micronet, Feb 89

... a superb package ... an excellent buy

Archive, March 89

... a highly versatile and impressive package

Art Nouveau is a good way to get the most from the Archimedes ...

Popular Computing Weekly, March 89

... clearly a quality product ... a powerful and versatile addition to the range of art packages for the Archimedes at a highly attractive price ...

Risc User, April 89

... ideal for the education market ... Art Nouveau is difficult to fault ...

The Micro User, June 89

Art Nouveau beats all comers ... stands way above anything available for the Arc. so far.

BBC Acorn User, August 89

Art Nouveau THE choice for schools, colleges and professional artists.

Order now our 24-HOUR ACCESS CREDIT CARD HOTLINE on (0698) 733775 or send a cheque/postal order for £42.50 made payable to:

COMPUTER ASSISTED LEARNING LTD (Dept AU)
Strathclyde Business Centre
Princess Road
New Stevenson ML1 4JB



EST. 1987

Please send S.A.E. for Further Details

Site licences available to Education Authorities

BBC ACORN USER MAY 1990

CARE ELECTRONICS

800 St. ALBANS ROAD, GARSTON, WATFORD,
HERTS. WD2 6NL TEL: 0923 672102

For your convenience first price Ex VAT, second Inc VAT

CARE MASTER SMART CARTRIDGE

(BBC Master only)

At the press of a button halt any program running and execute any one of a host of useful built in, or user defined functions and once completed will return to the program and continue. Built-in functions include: Tape to Disc, Screen Dump to Disc or Printer, Sound On/Off, Autosave and much more £30.00 £34.50c.

CARE MASTER ROM CARTRIDGES

For Interword and Spellmaster etc

(1) Dual Cartridge Takes 2 Roms	£10.00	£11.50c
(2) Single Zif Takes 2 Roms	£14.00	£16.10c
(3) Dual Zif Takes 2 Roms	£18.00	20.70c
(4) 32K Switchable cartridge takes 32K	£12.00	£13.80c
(5) Quad Cartridge Takes 4 Roms		
including double height type	£14.00	£16.10c
Morley AA (internal) Rom Board	£40.00	£46.00d

BBC B ROM CARTRIDGE SYSTEM

BBC B Low Profile Rom System	£13.00	£14.95d
BBC B Spare Cartridge	£3.00	£3.45c
Library Storage Rack	£1.20	£1.38c



HEAT TRANSFER RIBBONS

Print onto normal computer paper ...
Iron onto T-Shirt



Star LC10 Multicolour Ribbon	£17.00	19.55c
EPSON FX80, LX80, LX800/STAR NL10, NX10/		
OKIDATA ML80	£10.00	£11.50c
CITIZEN 120D	£11.00	£12.65c
EPSON FX100 (Black)	£11.00	12.65c
STAR LC10 (Black)	£12.00	13.80c
Heat transfer colour pens-jumbo (5 in a set)	£15.00	£17.25c
Heat transfer colour pens-small (5 in a set)	£12.00	£13.80c
The colour of pens in a set are Red, Green, Yellow, Orange, and blue.		

EPROM PROGRAMMER V2

Programs 8K, 16K, 32K CMOS or NMOS devices voltage selectable 21V or 12.5V. Complete with comprehensive software which includes Rom management system, plugs into the user port. £30.00 £34.50c
EPROM utilities disc. £6.00 £6.90c
EPROM eraser with timer. £25.00 £28.75d

TECHSOFT CAD PACKAGES

For the Master & Archimedes

Designer for the Master	£113.00	£129.95c
Designer Intro for the Archimedes	£73.00	£83.95c
Designer for the Archimedes	£193.00	£221.95c

A3000 RAM BOARDS

1 MEG RAM board upgradable to 3 MEg	£129.00	£148.35d
3 MEG RAM board upgrade	£349.00	£401.35d

MORLEY TELETXT ADAPTOR

Comes complete with 16K ATS Rom, utilities Disc and manual at the unbeatable price of £90.00 £103.50b

LABELMASTER PLUS

Now includes user definable label sizes
and mailing list facility.

Labelmaster BBC B	£15.00	£17.25c
Labelmaster Plus for Master, Compact, Archimedes. Please state model when ordering	£17.35	£19.95c

PRINTER SWITCHES

Two computers to one printer (or vice versa)	£20.00	23.00b
Three computers to one printer (or vice versa)	£30.00	£34.50b
Four computers to one printer (or vice versa)	£36.00	£41.40b

Please note that all the above units switch all lines, are suitable for all types of printer and computers using Centronics Parallel and INCLUDE LEADS

User port switch 2 to 1 off	£25.00	£28.75d
-----------------------------------	--------	---------

CARE READY MADE LEADS RANGE

BBC/Master RGB to Scart (Euro)	£9.00	£10.35c
BBC/Master RGB-7 Pin Hitachi	£7.00	£8.05c
BBC/Master RGB-7 Pin Ferguson	£7.00	£8.05c
Centronics to Centronics Printer	£11.00	£12.65c
User Port Extension lead 0.5m	£9.00	£10.35c
1MHz Bus Extension lead 0.3m	£10.40	£11.96c
Wide range of leads in stock - Please Phone		

Government & Educational orders welcome. How to order: Enclose your cheque or P. order made payable to CARE ELECTRONICS. Access or Visa cards welcome. Please allow 7 days for delivery. Please add Post & Packing - a=£11.50; b=£3.45; c=£1.38; d=£2.30



QUESTIONS AND ANSWERS

Q I've just been given a disc drive for my BBC micro by a friend. Unfortunately he made some modifications to the original drive concerning the links and the cabling.

Together we think we have returned things to normal, but before I start using it in earnest I am anxious to check the drive loads, saves, reads and writes data properly.

I don't want to go to the expense of taking my 'new' drive to a dealer for a service check. So can you recommend any programs that I could run on my system to check everything is functioning properly?

A You need a 'disc drive soak test' program but this is missing from disc doctor or disc utility packages. There is one in Michael Coleman's book *Disk Programming Techniques for the BBC microcomputer* published by Prentice Hall. It's

called *Soak* and is ideal for testing suspect drives. The program will force a suspect drive to carry out repeatedly those operations which are likely to lead to the corruption of the disc's formatting.

If your drive completes the test you should have nothing to worry about.

Q A colleague of mine uses *Wordwise Plus* and has no trouble in printing multiple copies of a document.

I would very much like to do this using *View* or *View Professional*. I have read the manual and can find nothing to help.

A There is no simple solution to solving your problem as there is with *Wordwise Plus*, where you can write a segment program to produce multiple copies. But there are some possibilities. In both *View* and *View*

Professional, you could program one of the function keys to carry out an individual PRINT and then you merely press that programmed function key again and another print is carried out for you – but that hardly automates the printing process!

It is also possible to produce multiple copies of documents by using the *View* macro facilities. In this case, your document would have to be the macro with the DM (define macro) stored command at the start of the document and named say <AA>. You would then place the stored command EM (end macro) at the end of the document. Also place a PE (page eject) command just before the EM to ensure a page eject at the end of the document.

With your document set up as a macro you merely call it and you should be able to print multiple copies. If you are unclear about the concept of macros, *A Dabhand Guide to View* from Dabs Press gives a good introduction.

Q At work they have a 'spare' IBM colour monitor. Can this be used with my BBC Master 512, which at present has a green screen monitor?

A You will certainly be able to use the IBM monitor with your BBC micro as it is

broadly compatible with the RGB colour input that the BBC Master expects. However, you should not expect it to function as an IBM style monitor when you are using the Master with the 80186 co-processor active.

The IBM monitor will function as any BBC colour monitor. Rather than hunt for a suitable 9-pin D female to 6-pin DIN male, it will be relatively easy for you to change the connector to a BBC one.

Any IBM dealer will tell you the pin-out on the D connector and you should match this to the DIN by referring to the pin assignments shown on page 240 of the Master Welcome Guide.

The only problem will be in the connection of the intensity line which should be connected to either the +5v or the Ground. Try and see which gives you a suitable level of colour.

Q Help! I am experiencing some difficulties with the transfer of files between my Psion Organiser and my BBC Master. I've tried writing my own program but it is totally ineffective. Are you aware of any published software?

A You obviously missed the article in the May 1989 issue of *BBC Acorn User*. It was called *Data Gets Going* and was all about connecting up a Psion Organiser to a BBC computer

If you have a problem with an Acorn micro, commercial software or a program you are trying to write then *BBC Acorn User* can help. The Post A Problem service guarantees to give you a personal answer within 10 working days for just £4.

Write out your problem with as much detail as possible and, if a program is involved, include a disc or cassette. Fill in the coupon at the bottom of this page and send it and your problem along with a cheque or postal order for £4 (including VAT) made out to Redwood Publishing. If you want recorded delivery add on the cost of this.

Please note that debugging readers' own programs or those from other magazines is a complex task and we cannot guarantee to give a full solution. Unless the problem can be spotted quickly, the Post A Problem service will only be able to make general comments. The service will answer the problem and return all material received within 10 working days of receipt. If we fail to match this promise then your cheque or postal order will be returned – you can't lose!

BBC ACORN USER READER SERVICE
20-26 Brunswick Place, London N1 6DJ.

NAME _____

ADDRESS _____

POSTCODE _____

DAYTIME PHONE NUMBER _____

I enclose a cheque/postal order for £4 made out to Redwood Publishing and an sae with my problem.

OFFICE USE ONLY Date in:

Date out:

Answered by: _____

and passing data between them. This will solve all your problems and you will be able to transfer data without any further trouble.

Q I have a BBC micro and recently it has been interfaced to a Panasonic KX-P4450 laser printer to produce text and graphics. Unfortunately the results of the graphics screen printouts are not as good as I was expecting.

A Due to the high resolution of the printout available from a laser printer it is inevitable that a BBC screen dump will appear to be 'chunky' on a laser printer. Some improvements can, however, be made.

Presumably, you are currently using your laser printer in the Epson emulation mode, and using a normal BBC screen dump. If this is the case, with a Rom like *Dumpout 3* from Watford you may be able to effect some improvements by altering the linear step in which the dots are printed horizontally and vertically.

With *Dumpout 3* this is achieved by altering a parameter of *GIMAGE. However, the best answer to your problem is to use the printer's built-in HP LaserJet emulation. The November 1988 issue of *Acorn User* contained a listing of a mode 1 dump.

Q I am looking for a word-processor I can use on my BBC Master 128 that allows me to produce text with at least 200 characters across the page. Is a package available?

A The traditional favourite wordprocessors for the BBC like *View* and *Wordwise* won't meet your requirements. *View* will print up to 132 characters a line, while *Wordwise Plus* can print up to 180. Probably the best bet would be *View Professional* marketed by Colton Software.

Another possibility is to use *Wordpower* from Ian Copestake Software, 10 Frost Drive, Wirral, Merseyside L61 4XL. This will manage 250 characters.

Q Is it possible to use hard disc drives made for an IBM PC or compatible with my Archimedes 410/1?

A Yes, it is possible to use hard discs produced for IBM PC or compatibles with the Archimedes 410/1. The computer comes with a hard disc interface built-in, so upgrading is easier than with an A310.

Q We have just purchased a secondhand BBC model B+ for our school and are experiencing considerable difficulty in using much of our original BBC model B software with the 'new' machine. We thought there was a high degree of compatibility between these machines. What has happened?

A The introduction of the BBC model B+ machine did start the issue of compatibility across the range of BBC computers. There were some software and hardware differences between the two machines – an additional 20K of shadow screen memory, 12K of side-ways Ram and the 1770 disc interface replaced the 8271 interface.

This means, as you have found out, that a number of your original educational programs do not function or work differently. However, you say you cannot use most which seems far worse than it should be.

There should be few problems about Acorn's decision to change disc interfaces. The 1770 system is broadly compatible with the older 8271.

You may find that programs from 4Mation Software or Sherston, for example, do not run because of the way they have been protected. However, both these companies will happily provide replacement versions for around £4.

Also, some years ago Vine Micros of Marshborough, Sandwich, Kent (Tel: (0304) 812276) produced a package costing about £15 which allows the BBC B+ to function just like an ordinary model B.

ACORN CUSTOMER HOTLINE

Users of *First Word Plus* releases 1 and 2 who have an Epson LQ series printer with a cut sheet feeder may have experienced problems when printing documents of longer than a page in length.

This is easily cured by editing out the 'Vertical tab to line' option within the source (Hex) printer driver and then recreating the printer driver.

How to edit the source printer drivers and recreate them is documented in both the release 1 and 2 *First Word Plus* user guides but if you need more details, the Customer Services department has an application note available which covers the operation in more detail.

For a copy of this application note please send an A4 SAE to Customer Services at the Fulbourn Road address

● Some users have been experiencing problems driving the Qume Crystalprint Publisher from the parallel port of the Archimedes. Discussions with Qume have confirmed a problem existed in the firmware of the Qume CrystalPrint.

The problem has now been fixed and you can obtain a free upgrade of the firmware directly from Qume, Bridgewater Close, Reading, Berkshire RG3 1JT. Tel: (0734) 584646.

● As many of you will be aware, up until now the only way to obtain the Acorn Outline fonts and the Acorn Outline Font Manager was to purchase Acorn's *Desktop Publisher* package.

Acorn has now released the fonts on separate discs. The Font starter pack contains the Font Manager, and the Corpus, Trinity and Homerton Fonts. The NewHall Font is being released

on another disc (along with the Font Manager).

The cost of these Font packs is £51.75. The product codes are SKF01 for the Font Starter pack and SKF02 for the NewHall Font Pack. Both products are available from your local Acorn Dealer.

● For people who wish to know more about the hardware of the A3000, Acorn has released the A3000 Technical Reference Manual containing details about the circuitry of the machine.

This manual will be particularly useful to people who wish to develop internal or external expansions for the A3000.

The manual contains details of the size the cards need to be and the connections to the expansion port. The manual is also supplied with circuit diagrams of the A3000.

The recommended retail price for the A3000 Technical Reference Manual is £29.95. The product code for the manual is AKJ75 and it is available from your local Acorn Dealer.

● Acorn's Support Information Database (SID) has proven to be very popular with Acorn users who have a modem. SID now has over 1600 regular users who are able to use all the facilities offered by the system.

Please remember that anyone who has a modem can use SID and have access to its many features such as sending technical enquiries to Acorn staff, leaving bulletins for other users to read and help with problems as well as download the vast amounts of software and textual information available for the Archimedes series, BBC A3000, BBC model B, B+ and Master 128.

Access can be gained to the system via Prestel by typing *SID# while online, using Fasttrak or directly. For further information on SID please contact Customer Services.

Peter Dunn

Peter Dunn and the Acorn Customer Services Department can be contacted at Acorn Computers, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN.



Computaccount (UK) Ltd
11 High Street, Harborne
Birmingham B17 9NT
Tel: 021 428 1111
Fax: 021 428 2028

**We are major suppliers to the
educational and health sectors**

**FULL
SUPPORT
&
BACKUP
FOR EDUC.
USERS**

Please telephone for our free extensive catalogue and price list.

Archimedes

Acorn A3000 1mb Ram 3.5" Disc Drive	£649.00
A410/1 1mb Ram 3.5" Disc Drive + Hard Drive Controller	£1199.00
A420/1 2mb Ram 3.5" Disc Drive + 20mb Hard Disc	£1699.00
A440/1 4mb Ram 3.5" Disc Drive + 50mb Hard Disc	£2499.00
Colour Monitor for A3000 & A400 Range	£220.00

Acorn Archimedes Accessories

A3000 Monitor Stand	£29.00
A3000 Serial Upgrade	£19.00
A3000 1mb Ram Upgrade	£199.00
A3000 User Port/Midi Podule	£49.00
Prog. Ref. Manual (Risc Os)	£72.00
Risc Os Operating System	£29.00
Podule Backplane for A310	£39.00
ROM Expansion Card	£99.00
I/O Expansion Card	£85.00
Midi add on to I/O	£39.00
Midi Podule	£69.00
Econet Module	£43.00
PC Emulator	£99.00
1mb Ram A400/1 series	£199.00
2nd Floppy A440/1 series	£125.00
2nd Floppy A300 series	£115.00
20mb Hard Disc A300 series	£499.00

PRES Archimedes Accessories

A3000 Monitor Plinth	£24.95
A3000 System Housing	£69.50
A3000 External Podule Case	£14.95
A3000 Disc Buffer Board	£48.95**
A3000 20mb Hard Disc	£429.00**
A3000 3.5" Floppy	£75.00**
A3000 5.25" Floppy	£99.00**

Items marked ** require System Housing

Computerware Archimedes Accessories

A3000 1mb Ram Upgrade	£150.00
A3000 2mb Ram Upgrade	£275.00
A3000 3mb Ram Upgrade	£415.00
A3000 TV Modulator	£34.95
A3000 External 20mb Hard Drive	£399.00
A3000 External 45mb Hard Drive	£499.00*
A3000 External 75mb Hard Drive	£659.00*
A400/1 Internal 20mb Hard Drive	£199.00
A400/1 Internal 40mb Hard Drive	£379.00
A400/1 Internal 50mb Hard Drive	£499.00
A400/1 Internal 45mb Hard Drive	£449.00*
A400/1 Internal 75mb Hard Drive	£549.00*

Items marked * require SCSI card

Acorn Master & BBC Accessories

Master 128K Computer	£409.00
Master Econet Module	£49.00
Master Turbo Upgrade	£120.00
Master ROM/RAM Cartridge	£11.95
Master Battery Pack	£4.95
Master Welcome Disc	£10.00
Master Welcome Guide	£10.00
Master Ref. Manual 1	£14.95
Master Ref. Manual 2	£14.95
Econet Upgrade Kit	£59.00
1772 DFS Upgrade Kit	£49.00
ADFS Rom	£26.08
DNFS Rom	£17.91
64K Upgrade Kit (B+ only)	£34.74
ATPL ROM/RAM Expansion	£38.00

BBC B & Master Software

Interbase	£59.00
Interchart	£32.00
Intersheet	£49.00
Interword	£49.00
Printmaster	£29.00
Spellmaster	£51.30
View 3.0	£52.00
Viewindex Disc	£13.00
Viewplot Disc	£26.04
Viewsheets	£52.00
Viewspell	£34.74
Viewstore	£52.00
Printer Driver Disc	£10.00
Wordwise Plus	£49.00
System Delta	£56.48
System Delta Reference Guide	£17.35
System Gamma	£43.43
System Delta order/Invoice	£39.96
System Delta Sales Ledger	£39.96
System Delta Stock Man	£39.96
System Delta Purchase Ledger	£39.96
System Delta Nominal Ledger	£48.65

Dot Matrix Printers

Amstrad DMP325di	£149.00
Amstrad DMP4000	£229.00
Amstrad LQ3500 (24 pin)	£229.00
Amstrad LQ5000di (24 pin)	£379.00
Brother M1109	£179.00
Brother M1209	£229.00
Brother M1709	£445.00
Brother M1224 (24 pin)	£339.00
Brother M1724 (24 pin)	£629.00
Brother M1824 (24 pin)	£525.00
Brother M254 (24 pin)	£889.00
Citizen 120D	£145.00
Citizen 180E	£199.00
Citizen MSP55	£649.00
Citizen HQP45	£499.00
Citizen Pro-Dot9	£365.00
Citizen Pro-Dot9X	£465.00
Citizen Pro-Dot24 (24 pin)	£499.00
Citizen Swift24 (24 pin)	£359.00
Colour Kit Pro-Dot	£60.00
Colour Kit Swift24	£39.00
Epson LX400	£189.00
Epson LX850	£239.00
Epson FX850	£429.00
Epson FX1050	£499.00
Epson LQ400 (24 pin)	£229.00
Epson LQ550 (24 pin)	£329.00
Epson LQ850 (24 pin)	£579.00
Epson LQ1050 (24 pin)	£709.00
NEC P2200 (24 pin)	£335.00
NEC P6plus (24 pin)	£579.00
NEC P7plus (24 pin)	£749.00
Star FR10	£391.00
Star FR15	£509.00
Star LC10	£169.00
Star LC1011	£195.00
Star LC15	£339.00
Star LC24-10 (24 pin)	£254.00
Star LC24-15 (24 pin)	£424.00
Star XB24-10 (24 pin)	£509.00
Star XB24-15 (24 pin)	£671.00

DAISYWHEEL

Brother HR20 D/I	£469.00
Brother HR40 inc. Sheetfeeder	£895.00
Brother Twinwriter	£895.00
Juki 6300	£399.00
Juki 6500	£799.00
Olympia ESW1000C	£359.00
Olympia ESW2500i	£629.00
Panasonic KXP3151	£479.00

DISC DRIVES

Cumana CSX400 40/80T	£112.00
Cumana CS400S 40/80T	£129.00
Cumana CDX800S Dual 40/80T	£216.00
Cumana CD800S Dual 40/80T	£242.00
Cumana CCD2000 Dual (3.5 & 5.25)	£219.00

**WIDE RANGE
OF BBC/MASTER
AND
ARCHIMEDES
SOFTWARE**

**Please telephone
for our
FREE
extensive
catalogue and
price lists.**



**Hundreds of
products listed
at excellent prices.**

HOW TO ORDER

Payment by cheque to:
COMPUTACCOUNT (UK) LTD

Carriage: Items less than
£50: £2.50, £50-£100: £4.50
Carriage and insurance on
items more than £100: £9.50

Please add VAT at 15% to Total,
including Carriage

Send to Computaccount (UK) Ltd., 11 High Street, Harborne, Birmingham B17 9NT
or Telephone 021-428 1111 with your Access details

Items subject to availability. Prices subject to change without notice. Please phone to confirm current price and availability before placing order.



NAME

ADDRESS

Tel:

Quantity

Item

Price

£ £

£ £

£ £

Total £

16 bit SCSI

Oak's high speed 16 bit SCSI podule offers a new level of performance for the entire Archimedes range (including the A3000) with data transfer rates of up to 1.4Mb per second, a considerable increase over both ST506 and 8 bit SCSI controllers. Up to 2 Gigabytes of winchester storage may be fitted per machine, and seven SCSI devices including 4 winchesters may be attached to the card.



The card provides a new filing system 'SCSIFS', and an icon and filer for the Risc OS desktop. It can work in tandem with ADFS winchesters, and is compatible with the PC emulator. Low level (SWI) support is provided for other SCSI devices (e.g. tape streamers, CD ROMS etc.)



Internal winchester kits are supplied as 'plug in and go' units, with all necessary cabling and mounting hardware, and external drives are supplied in sturdy metal cases, colour matched to the Archimedes, and have their own power supply and fan. External drives are also suitable for the A3000.

A comprehensive manual with easy to follow fitting instructions is provided with each system, along with a versatile formatting and utility program. Oak SCSI drives may be write protected for security.

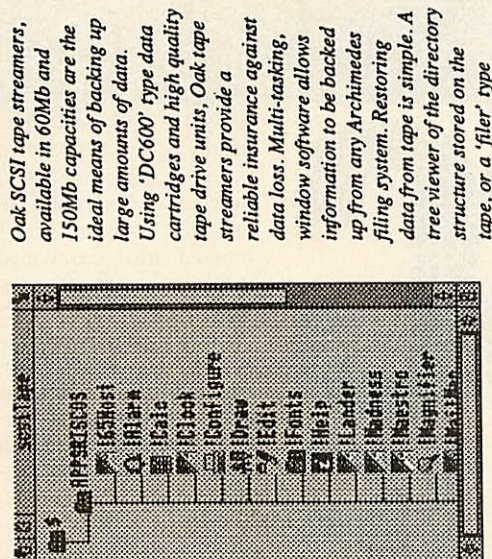


All Oak SCSI winchester drives are subjected to rigorous quality control procedures, and each drive comes with its own test certificate.

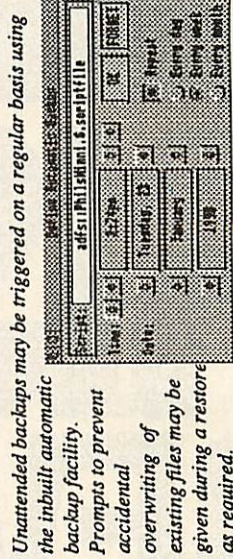
Internal Drives (inc. SCSI card)		External Drives (inc. SCSI card)	
20Mb (HDINARC20SC)	£375.00	20Mb (HDEXARC20SC)	£535.00
45Mb (HDINARC45SC)	£495.00	45Mb (HDEXARC45SC)	£655.00
80Mb (HDINARC80SC)	£795.00	80Mb (HDEXARC80SC)	£955.00
100Mb (HDINARC100SC)	£1114.00	100Mb (HDEXARC100SC)	£1274.00
200Mb (HDINARC200SC)	£1458.00	200Mb (HDEXARC200SC)	£1618.00
SCSI Card (SCSARC)	£199.00	330Mb (HDEXARC330SC)	£2845.00
SCSI Card (SCSH00)	£199.00	P&P external drives	£15.00
P&P Internal drive/card	£10.00		

16 bit SCSI Controller Card and High Speed Winchester Drives

Tape Backup



Oak SCSI tape streamers, available in 60Mb and 150Mb capacities are the ideal means of backing up large amounts of data. Using 'DC600' type data cartridges and high quality tape drive units, Oak tape streamers provide a reliable insurance against data loss. Multi-tasking, window software allows information to be backed up from any Archimedes filing system. Restoring data from tape is simple. A tree viewer of the directory structure stored on the tape, or a 'filer' type display can be shown in a window, and then the files to be restored can be simply 'dragged' with the mouse to the destination filing system, or even into an application!



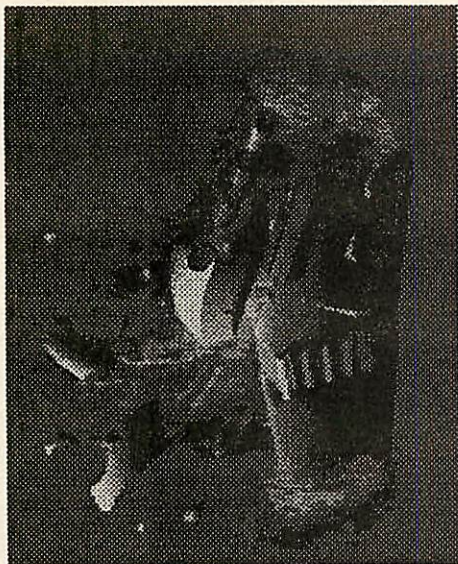
Unattended backups may be triggered on a regular basis using the inbuilt automatic backup facility. Prompts to prevent accidental overwriting of existing files may be given during a restore as required. Note: An Oak SCSI controller card is required. Drives are supplied with 1 free tape cartridge.

Tape Streamers	
60Mb without SCSI card (TS60SCA)	£999.95
60 Mb with SCSI card (TS60SC)	£1099.95
150Mb without SCSI card (TS150SCA)	£1254.00
150Mb with SCSI card (TS150SC)	£1354.00
P&P on Tape Streamers	£15.00
60Mb Tape Cartridge	£24.95
150Mb Tape Cartridge	£27.95
P&P on Tape Cartridges	£0.75

SCSI Tape Streamer

Tank Game

A challenging arcade classic demonstrating the amazing speed of the Archimedes.



Pilot your high speed battle tank and attempt to destroy the alien invasion fleet. Protect yourself from enemy fire by hiding behind numerous monoliths. Avoid the deadly minefields. Use your limited flight capability to your advantage by dodging enemy fire and crushing alien tanks. But keep an ear open for the deadly heat seeking neutron fighter. Stunning 3D graphics accompanied by realistic digital sound make this a game not to be missed.

Only £14.95
P&P £0.75

WorraBattle



Oak Computers
Cross Park House
Low Green
Rawdon
Leeds
LS19 6HA

Tel: 0532 502615
Fax: 0532 506868





£30

In past Risc Revues we've delved into the depths of 3D drawing and surveyed the scope of scaled sprites.

Now, we proudly present a program that combines these two techniques.

It comes from Philip Armstrong of Leeds.

Philip noticed that in many new arcade games, scaled sprites are used to create the effect of three dimensions.

For example, a road sign in a driving simulation need only be defined once. Then, when plotted on the screen, it can be sized according to the car's distance from it.

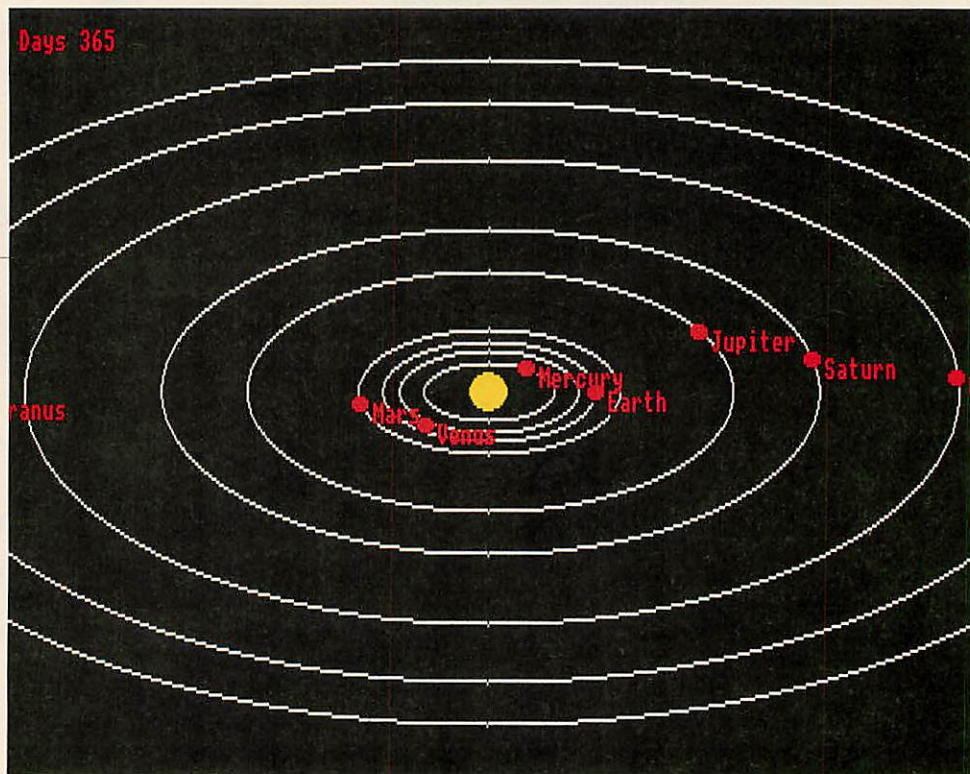
On the Arc and BBC A3000, Risc OS makes sprite-scaling almost wickedly simple as Philip's listings illustrate.

Run listing 1 on the yellow pages. This creates a sprite of a shaded ball and saves it as a sprite file.

The program operates in mode 9 – a 16 colour mode. In fact, as Philip points out, any graphics mode could be used with any shaded sphere as a sprite, although mode 9 makes for speedier animation of the screen display.

The procedure PROCgreys sets the palette to a scale of grey shades. Sprite operations are performed in listing 1 in the yellow pages with SYS sp%,... where sp% is the SWI number for "OS_SpriteOp" (that is, &2E).

SYS sp%,15,,"name",p,w,h,m creates a mode m sprite called 'name' of width w and height h. Palette data is included in the sprite's definition if p is 1; but this information is left out if p



RISC REVUE

is 0. SYS sp%,29,,"name" creates a mask for a sprite.

The call SYS sp%,60,,"name" TO r0,r1,r2,r3 is new to Risc OS and diverts graphics operations to the sprite. In this way the sphere is actually drawn 'within' its sprite whereas, prior to Risc OS, the image would have had to be drawn on the screen and then 'grabbed'.

When the sprite file Ball9 has been created, run listing 2. A

three dimensional pattern of spheres is shown. To rotate the image, move the mouse around. Hold down the left mouse button to 'zoom in' or the right button to 'pan out'.

You may also use the cursor keys to move the image in the x and y directions. The time taken to show a single frame is displayed in the top left corner of the screen. Next to it is the shape number. To select a new shape

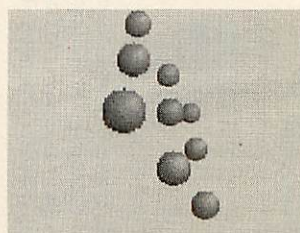
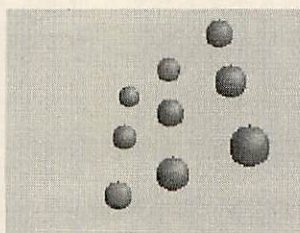
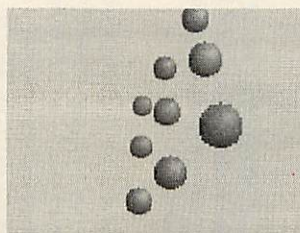
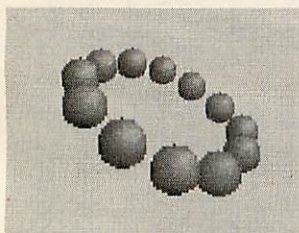
press 1-6. Obviously the complexity of the shape determines the time taken to plot it. Not only must more sprites be plotted on the screen but the spheres must be sorted according to their depth so that the rearmost one can be plotted first.

PROCnew is responsible for setting up the x and y co-ordinates for the currently selected shape. Shapes 1-5 are defined by calling three special procedures – PROCplane, PROCdisc and PROCshapes.

Shape 6 is made up of points listed in the DATA statement at the end of the program and data is read in by PROCreaddata.

Simply replace these values with your own x, y and z co-ordinates to define your own shapes (remembering to increase the value of pnts% if necessary so the arrays defined are large enough).

The scaled sprite plotting is done with SYS "OS_SpriteOp",52 in PROCplot. In fact the SpriteOp number is 308 (that is, 52+256) because a user sprite area is used rather than the system area. The last parameter is the address of



Scaling 'spherical' sprites makes 3D graphics look simple. It's all trickery of course

a scale table. This scale table contains four values: `xmult`, `ymult`, `xdiv` and `ydiv`.

The sprite is plotted `xmult/xdiv` times actual size in the x direction and `ymult/ydiv` in the y.

SHORT SORT

After the piece about `SYS "OS_HeapSort"` in a recent Risc Revue I started to experiment with the good old QuickSort algorithm to see how fast an implementation could be written on the Arc.

The result is listing 3 which I don't claim to be the fastest thing I have ever written. Nevertheless it plods along at a pretty reasonable rate – sorting 100,000 randomly arranged integers into order in about 5.5 seconds.

Run listing 3 and specify how many integers you would like to sort. The random table is built up and then sorted.

The procedure `PROCshow` is used to show a selection of the sorted values. If you'd like to see them all (to prove it isn't cheating) type `PROCshow(1)`.

Incidentally, you'll probably notice that a random number seed (`seed%=RND(-&DCA)`) has been introduced into the procedure. This is for speed-testing purposes.

The actual principle of the QuickSort algorithm is very straightforward and many readers will already be familiar with it. The idea is to take a 'pivot' value – the value of one of the elements of the array of numbers to be sorted.

The numbers are then rearranged so that the first part of the array consists of values less than the pivot and the rest of the values greater than or equal to the pivot.

These two parts are then sorted in the same way and the process continues recursively until the whole array is in order. I must credit the inventor of QuickSort, one C Anthony R Hoare, for coming up with such a neat idea.

£10 SPACE AGE

A simple but effective little program, this one, from Barry Wickett of Walsall. It shows the planetary motions of our very own solar system and you'll find it as listing 4 on the yellow pages. The mouse can be moved around to alter the scale of the diagram. Normally, the paths of the planets are shown in red but holding down a mouse button removes the paths (and speeds up the planetary motions accordingly).

The number of days that have elapsed is shown top left.

As Barry points out, the representation is a much-simplified one. The planets do not travel in circular orbits and are not exactly aligned. In fact, the orbits should be elliptical, and tilted at various angles to the main plane.

However, the lengths of the planets' 'years' are portrayed accurately and hence the demonstration does show how bored the poor old Plutonians must get waiting for Christmas to come around.

Perhaps the feature of Barry's program that I found most pleasing though was the fact that all the arrays are DIMmed to size 10, not 9.

This is an excellent example of forward planning – when the mysterious planet 'X' that has evaded astronomers for so long is finally discovered, we will be prepared!

KEY NOTE

I'm sure many people who move up to the Arc or A3000 from Masters and Beebs find confusion with the numerous "OS_Byte" calls affecting keyboard input values.

Particularly strange are the calls which determine the actions of the function keys, not least because keys f10 to f12 are treated separately from the rest. This is, I suppose, an unavoidable throwback to the days

of the Beeb and its famous row of just 10 red function keys along the top.

Further problems occur if you wish to make use of the cursor keys. Often, if you're writing an editor of some description, it is necessary to detect SHIFT and CTRL with both function and cursor keys.

The easiest way to manage all these keycodes is to write your own INKEY or GET routine that employs a special case of the relevant "OS_Byte" calls. The calls *FX 225 to *FX 228 define the codes produced by function keys f0-f9 when pressed by themselves, with SHIFT, with CTRL and with SHIFT+CTRL respectively.

Using *FX 225,2, *FX 226,2 and so on, causes these keys to produce a 'null' (Ascii code 0) followed by a unique key code.

If you also use the call *FX 4,2 so the cursor keys and the copy key produce keycodes, these too will be preceded by a zero.

Function keys f10-f12 and the Insert key can be controlled in the same way, but these have their own set of "OS_Byte" calls – *FX 221 to *FX 224.

Having set up the keys using *FX 221,2 to *FX 228,2 you can then make use of the extra zeros that are produced in your own input routine.

If you add &100 to the key-code if a zero is spotted first, you end up with a unique number in the range 0-&1FF. In this way the European ('top-bit-set') characters cannot be confused with function key codes.

Incidentally, the true Ascii code 0 produced by CTRL-@ is also preceded by an extra zero to avoid ambiguity.

All this is summed up in listing 5. The function `FNinkey` takes note of extra zeros and returns unique values accordingly. `PROCinitkeys` makes the relevant "OS_Byte" calls to set things up and `PROCreset` returns things to normal.

If you've programmed in the desktop environment you'll be aware that the keycodes sent to applications are the same as

those produced by `FNinkey`. The only exception is the TAB key which, you've guessed it, has its own "OS_Byte" call.

*FX 219,42 causes the TAB key to produce code 42. More usefully, if the TAB key is programmed with a value of &80 or more (and the function keys have already been set up with *FX 221 to *FX 228) then the TAB key can be made to behave exactly like a function key.

The desktop treats the TAB key like the old function key 10 on the Beeb. You can do this with *FX 219,&8A. Add this command to `PROCinitkeys` to see the effect.

OS VARS

A quick snippet this. I recently needed to create a menu in a particular application that contained all the 'named' file types (Obey, Sprite, Text, and so forth).

The small program segment needed usefully illustrates how the `SYS` call "OS_ReadVarVal" can be used and is given as listing 6. The call is made with a wildcarded string (in this case, "File\$Type_####"). A buffer (useful%) is provided in which to store any values found.

After the initial call is made, two values are returned – `l%` (the number of bytes read) and `p%` (a pointer that is returned to "OS_ReadVarVal" when the next match is sought).

Listing 5 continues to display the values of any matching variables until `l%=0`, when there are no more.

EXPOSE YOUR TALENTS

Send some samples of your programs, ideas, hints and tips for these pages to:

Risc Revue
BBC Acorn User
Redwood Publishing
20-26 Brunswick Place
London N1 6DJ.

Show off your programming abilities to those who'll appreciate them...

MUPADOS RECORDER TUTOR

Music Plays And Displays On Screen

- Teach a class of children to play the recorder for £11.99
- The best selling music software teaching aid in the UK
- Used in 65% of schools in Wales
- Only one Tutor per school required, no pre-lesson preparation needed
- Complete Tutor covers middle C to top G, enough work for a year
- Runs on BBC B and Master
- Christmas Carol, Folk Music & Classical Supplements available
- Scrolling display of Music, optional beat counter and "Bouncing Ball"
- Practice tempo controlled by user
- Available in 3 volumes; Volume I (includes music book and accompaniment tape for complete tutor) £11.99, Volumes II & III £9.99 each, Complete Tutor £24.99. Prices include VAT and P&P.
- Send for our **FREE** demo pack comprising demo disk, audio tape and video featuring Dr Carl Dolmetch
- LEAS may apply for bulk order discount
- Beware of imitators, purchase in safety from the creators:

Cue Video! (Wales) Ltd., Gerallt, Pontsian, LLANDYSUL, Dyfed, SA44 4UP.
Telephone Pontshaen (0545 55) 315.

GET LOST...

ACORN APPROVED
DEALER



PHONE
01-760 0274
01-667 0851

... IN THE WORLD OF CREATIVE COMPUTING AT SABRE TECHNOLOGIES
a dedicated **ARCHIMEDES** centre

WE CAN SUPPLY A LARGE RANGE OF ARCHIMEDES SOFTWARE AND A COMPREHENSIVE RANGE OF ARCHIMEDES HARDWARE!

A3000 SPECIAL DEALS

PACK1 SABRE MEGA PACK

INCLUDES A3000, COLOUR MONITOR, MOUSE MANUALS, RISC-OS, APPLICATIONS DISKS. ALSO INCLUDES THE GAMES HOLED OUT, E-TYPE, JET FIGHTER AND INTERDICTION, ART PACKAGE ARTISAN, WORDPROCESSOR WORDWISE +, AT THE AMAZING PRICE OF
£999.00 (inc VAT and postage within UK mainland).

PACK 2 SMALL BUSINESS PACK

INCLUDES A3000, COLOUR MONITOR, MOUSE MANUALS, RISC-OS, APPLICATIONS DISKS. PIPEDREAM (LATEST VERSION OF THIS INTEGRATED BUSINESS PACKAGE) PC EMULATOR AND STAR LC10 COLOUR PRINTER
£1350.00 inc VAT.

PACK 3 STANDARD PACK

INCLUDES A3000, COLOUR MONITOR, MOUSE MANUALS, RISC-OS, APPLICATIONS DISKS. **£899.00 inc VAT.**

PACK 4 BUDGET PACK

INCLUDES A3000, MOUSE MANUALS
RISC-OS APPLICATIONS DISKS.
£729.00 inc VAT.

Archimedes 400/1 Series

410/1 COLOUR SYSTEM	1475.00 (inc)
420/1 COLOUR SYSTEM	1920.00 (inc)
440/1 COLOUR SYSTEM	2675.00 (inc)

SOFTWARE SPECIAL OFFERS:-

BUSINESS/ART/UTILITIES		GAMES	
ALPS		COPS	24.99
RISC BASIC	84.95	PLAGUE PLANET	11.50
PRO ARTISAN	84.95	STAR TRADER	15.95
ARTISAN 2	49.95	TRIVIAL PURSUIT	24.99
PRESENTER II	39.99	UIM	24.99
ARMADUS	69.95	MISSILE CONTROL	10.95
FILM MAKER	58.50	ALL IN BOXING	11.95
KNOWLEDGE ORGANISER	49.95	WORLD CLASS L'DRBOARD	24.50
VIEW	49.95	CAVERN	14.95
GRAPHBOX	58.50	ARCADE SOCCER	16.50
EUCLID	58.50	FUGITIVES QUEST	24.50
SYSTEM DELTA PLUS (V20)	68.50	JET FIGHTER	12.95
		CHEAT IT AGAIN	7.50
		HOLED OUT	16.95
		HOLED OUT EXTRA 1	13.50
		HOLED OUT EXTRA 2	13.50
		INTERDICTION	29.95

CHEQUES & POSTAL ORDERS MADE PAYABLE TO
SABRE TECHNOLOGIES
UNIT 74/75, INSHOPS,
68-74 CHURCH ST, CROYDON, SURREY CR0 1RB

WE ARE OPEN MONDAY-SATURDAY 09.00-5.30



SOFTWARE Bargains

AND

Mercury Games

TITLE	RRP	SALE	TITLE	RRP	SALE	TITLE	RRP	SALE	TITLE	RRP	SALE
Boxing	14.95	£11.95	Conqueror	24.95	£19.95	INTER-DICTOR	34.95	£29.95	RISC-OS Prog Ref Manual		£79.00
Alps System	32.00	£27.95	Control Panel	17.20	£13.95	ISO Pascal (Release 2)	113.85	£99.95	RISC-OS	33.35	
Alpha Base	49.95	£44.95	COPS . NEW	19.95	£15.95	Jet Fighter	14.95	£11.95	(Customer responsible for installation)		
Ancestry	79.95	£69.95	Data Vision	99.95	£89.95	Keyword	29.95	£25.95	Rise in Crime	29.95	£24.95
Ansi C (Release 3)	171.35	£154.95	Delta Cat (Joystick)	29.95	£26.95	Knowledge Organiser	59.95	£54.95	Rotor . NEW	24.99	£19.95
ARC-COMM	29.95	£26.95	Deftbase	29.95	£24.95	Logistix . . . (includes manuals)	113.85	£99.95	Scan-Light Sensor	516.35	£479.95
ARC-PCB	195.00	£175.95	Desktop Publisher	171.35	£139.95	Logistix Manual Part 1	10.00	£8.95	School Administrator	79.95	£69.95
Arcade 3 Compilation	14.95	£11.95	Disc Tree V.2	49.95	£44.95	Logistix Manual Part 2	10.00	£8.95	Sigma Sheet	69.95	£59.95
(Zarkon Invasion, Mazey Man & Bounce-a-Ball)			Dust Cover A3000 Keyboard	5.95	£3.95	Maddingly Hall . NEW	14.95	£11.95	Software Dev. Toolbox	228.85	£199.95
Arcadium	14.95	£11.95	Dust Cover Archimedes	14.95	£9.95	Mailshot	39.95	£34.95	Solid CAD	49.95	£44.95
(Back Gammon, Draughts, Othello, & Connect Four)			Enthar seven	29.95	£24.95	Minotaur	14.95	£11.95	Spellmaster	44.85	£39.95
Arch, Reference Manual	29.95	—	Euclide (RISC-OS)	70.00	£59.95	Missile Control	14.95	£11.95	Star Trader	17.95	£15.95
Arch Operating System	21.95	—	Family Favourites	19.95	£15.95	Mogul	20.00	£17.95	Stock Management	64.95	£54.95
Arch Assembly Lang	21.95	£18.95	(Gridlock, Deadend & Braindrain)			Multistore	299.00	£244.95	Stranded	29.95	£24.95
Arch, Basic Computer	99.95	£89.95	Film Maker	79.95	£69.95	Newhall Font starter pack	51.75	£46.95	Super - Dump	24.95	£21.95
Arctivia	24.95	£19.95	Financial Accountant	175.00	£154.00	Orion	14.95	£11.95	System Delta Plus	79.95	£69.95
Armadaus	79.95	£69.95	Fireball 2 . NEW	24.95	£19.95	Overload	14.95	£11.95	System Delta Plus Ref Guide		£29.95
Armadaus Sound-			Flying Start 2	99.95	£89.95	Pac Mania	19.95	£17.95	Talisman . . NEW	14.95	£11.95
Samp, Board	149.95	£139.95	Fortran 77 (Release 2)	14.95	£11.95	PC Emulator	113.85	£113.85	Terramex	19.95	£17.95
Artisan 2	59.95	£54.95	Freddy's Folly	14.95	£11.95	Pipedream Spellcheck	49.95	£44.95	Things to do with Words	24.95	£19.95
Artisan 2 HP Driver	14.95	£11.95	Fugitives Quest	29.95	£24.95	Pipedream 3	171.35	£149.95	Thunder Monk	14.95	£11.95
Artisan 2 Star LC10 Driver	14.95	£11.95	Fun School 2 (0-6 yrs)	19.95	£15.95	Plaque Planet . NEW	11.95	£9.95	Timewatch	34.44	£29.95
Assembler	228.85	£199.95	Fun School 2 (6-8 yrs)	19.95	£15.95	Presentation 2	45.94	£39.95	Toolkit Module	39.95	£34.95
Atelier	99.95	£89.95	Fun School 2 (8+ yrs)	19.95	£15.95	Presenter Story	228.85	£199.95	Toolkit Plus	49.95	£44.95
Auto sketch	90.85	£79.95	Gamma Plot	69.95	£59.95	(phone for release)			Trivial Pursuit	29.99	£26.95
Avon	19.95	£17.95	GENESIS . NEW	99.99	£89.95	Presentation System	49.95	£44.95	Twin	33.35	£29.95
BASIC V -			Gerber Plot	125.00	£109.95	Pro Artisan	169.95	£89.95	U-Connect	59.95	£49.95
(A dabhand mini guide)	9.95	£8.95	Giant Killer	17.50	£15.95	Prolog	228.85	£215.95	View 3.0	59.80	£49.95
Battletanks . NEW	14.95	£11.95	Graph Box	79.95	£69.95	Realtime Solides Modeller	89.95	£79.95	Word Up Word Down	17.95	£15.95
Bug Hunter . NEW	17.95	£15.95	Graphic Writer	29.95	£24.95	Render Bender	79.95	£69.95	Wordwise +	23.00	£19.95
Bumper Disc 1 (Educ)	19.95	£15.95	Hearsay	69.00	£59.95	Render Bender -			World Class Leaderboard	29.95	£24.95
Bumper Disc 2 (Educ)	19.95	£15.95	Home Accounts	49.95	£44.95	Animated Discs	14.95	—	Zarch	19.95	£15.95
			Hoverbot	14.95	£11.95	Reporter	39.95	£24.95			
			Ibix the Viking	19.95	£17.95	Repton 3	19.95	£17.95			

BEST FOUR LANGUAGE PROGRAMS

(7-11 YRS)

Includes 4 best-selling programs which develop reading, spelling, vocabulary & other language skills:- POKD, HIDE & SEEK, WORDS & FACE MAKER

BEST FOUR MATHS PROGRAMS

(7-11 YRS)

Includes 4 more best selling programs which encourage accuracy in addition & subtraction, multiplication & factorisation, mental arithmetic and an understanding of shapes:- NUMBER PAINTER, TABLE ADVENTURES, NUMBER PUZZLER & SQUEEZE.

Both packages are very popular in schools and include activity book, work cards & puzzle book.

BBC 5.25" OR 3.5" Master Compact Disc RRP £36.80 (each)

OUR SALE PRICE £31.95 (Each)

OR BUY BOTH FOR £59.95

fun school 2

UNDER 6 YEARS Includes:-

- SHAPE SNAP:- Colourful shape recognition
- FIND THE MOLE:- Experiment with number sizes
- TEDDY COUNT:- Ideal introduction to number
- WRITE A LETTER:- Creative fun at the keyboard
- COLOUR TRAIN:- Play at spotting colours
- PICK A LETTER:- Word building made easy
- SPELL A WORD:- Enjoy naming the pictures
- TEDDY BEARS PICNIC:- Move around a maze

6-8 YEARS Includes:-

- NUMBER TRAIN:- Calculations made enjoyable
- SHOPPING:- Which shops for which products?
- MATHS MAZE:- Fun improving arithmetical skills
- TREASURE HUNT:- Introduction to co-operates
- BOUNCE:- Get to grips with angles
- PACKING:- Discover tessellatin shapes
- CATERPILLAR:- Wordbuilding challenge
- NUMBER 1 JUMP:- Have fun practising tables

OVER 8 YEARS Includes:-

- BUILDING A BRIDGE:- Shape-fitting challenge
- PASSAGE OF GUARDIANS:- Enjoy anagrams
- UNICORN:- First steps in problem solving
- LOGIC DOORS:- Mapping made easy
- SOUVENIRS:- An introduction to travel
- CODE BOXES:- Discover binary arithmetic
- MYSTERY MACHINE:- Have fun breaking codes
- ESCAPE:- A final check on progress

(PER LEVEL)	RRP	SALE
BBC/Ele Cass	9.95	7.95
BBC 5.25" Disc	12.95	9.95
ARC 3.5" Disc	19.95	15.95

ELECTRON SPECIALS

VIEW (ROM CART) £14.95

WORDPROCESSOR

VIEWSHEET (ROM CART) £14.95

BUY BOTH £19.95

BUT ONLY £10.00 FOR BOTH IF YOU

BUY ONE OF OUR PRINTERS!

LOGO (CART) £24.95

LISP (CART) £9.95

TURTLE GRAPHICS £2.95

(CART)

BUY ALL THREE £19.95

NEW EXPANSION BOARD

BASIC - 1 CARTRIDGE PORT

VIEW + VIEWSHEET £29.95

EXTENDED - 1 CARTRIDGE PORT, 1

PRINTER PORT, VIEW + V.SHEET £36.95

FULL - 2 CART PORT, 1 PRINTER PORT,

VIEW + V.SHEET £39.95

BEST BUY FOR THE ELECTRON YET!!

7 DIN - 3 JACK CASS LEAD £2.65

AERIAL LEAD £2.65

ADVANCED USER GUIDE £1.95

START PROGRAMMING

WITH THE ELECTRON £2.95

PANASONIC PRINTERS

KX-P1081 9 pin 80 col Dot Matrix Printer

RRP £251.85. Offer price £159.95

KX-P1180 9 pin 80 col Dot Matrix Printer

RRP £309.85. Offer price £169.95

KX-P1124 24 pin 80 col Dot Matrix Printer

RRP £458.85. Offer price £259.95

KX-P4450i Laser Printer

RRP £2294.25.85. Offer price £1699.95

Special Schneider Laser Printer Offer

RRP 1,544.45. Offer Price £999.95

(FULL SPECIFICATIONS AVAILABLE ON REQUEST)

Prices include VAT, and next-day courier despatch from stock: (UK mainland only) We will also supply a 1m BBC printer cable free of charge - or approx 50% off and Archimedes cable (RRP £18.95, therefore only £9.95 in conjunction with this offer)

INTEGRATED OFFICE SUITE

TITLE	E	RRP	SALE
Mini Office II	C	14.95	11.95
Mini Office II 40K	D	16.95	13.95
Mini Office II 80K	D	16.95	13.95
Mini Office II Master 40K	D	19.95	15.95
Mini Office II Master 80K	D	19.95	15.95
Mini Office II Master Cppt		21.95	17.95

DESKTOP PUBLISHING

TITLE	E	RRP	SALE
Admin Extra (State 40/80T)	D	14.95	11.95
Fleet St Editor (State 40/80T)	D	39.95	29.95
Fonts & Graphics (State 40/80T)	D	14.95	11.95
Walt Disney (State 40/80T)	D	14.95	11.95
Stop Press (Master)	D	49.95	41.95
Stop Press (B/B+)	D+R	49.95	41.95
Super Art (Master)	D	49.95	41.95
Mouse & Stop Press (B/B+)	D+R	79.95	69.95
Mouse & Stop Press (Master)	D	79.95	69.95
Mouse & Super Art (B/B+)	D+R	79.95	69.95
Mouse & Super Art (Master)	D	79.95	69.95

RECENT RELEASES

	BBC	BBC	BBC
	or ELE	Disc	Cpc
A question of sport	-	10.95	14.95
Ballistix	6.95	8.95	10.95
Barbarian 2	6.95	8.95	10.95
Blast	7.95	10.95	-
Exile	9.50	10.95	14.95
Life Of Repton	-	-	3.95
Living Daylights (not Master 128)	-	2.95	-
Perplexity	7.95	9.95	11.95
PLAY IT AGAIN SAM			
1 through 10 (each)	6.95	8.95	10.95
Play it again SAM 11+ 12 (each)	7.95	9.95	11.95
Predator	6.95	8.95	10.95
Repton Infinity	9.50	10.95	14.95
Ricochet	7.95	9.95	11.95
Superior Collection 1 (BBC only)	6.95	8.95	10.95
Superior Collection 2 (BBC only)	6.95	8.95	10.95
Superior Collection 3 (Ele)	6.95	8.95	-
Superior Soccer	7.95	9.95	11.95
Tank Attack	9.50	10.95	-
The Last Ninja 2	7.95	9.95	11.95

- * Please add 95p P&P (Europe £2.50, Outside Europe £4.50)
- * All prices include VAT
- * Goods despatched within 48hrs (subject to availability)
- * Out of hours answerphone .. 0532 436300
- * In order to preserve our low prices & fast service, we can only accept orders with a total order value in excess of £4.00

SOFTWARE Bargains

Dept AU50, C/O NORTHWOOD HOUSE
NORTH STREET, LEEDS LS7 2AA

Telephone **0532 436300**

Please make cheques payable to Software Bargains

For fast delivery telephone
your order on 01-205 9558
using VISA Access Card



Orders welcome from
government depts &
educational establishments

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8UF.

Tel: 01-205 9558 Fax: 01-205 0190

Mon-Fri: 9.15-5.30, Sat: 10.30-4.00

All prices ex VAT.
Prices are subject to
change without notice.

Please add carriage
(a) £8.00 (Courier, 2 days)
(b) £3.50 (c) £2.00 (d) £1.50
Next day delivery at extra charge

Archimedes COMPUTERS

A3000 (no monitor)	£599
A3000 (for TV use)	£649
A3000 Acorn Colour	£799
A410/1 (no monitor)	£1099
A410/1 Acorn Colour	£1299
A410/1 Taxan 770+	£1459
Acorn 420/1 systems	
420/1 (no monitor)	£1499
420/1 Acorn Colour	£1699
Acorn 440/1 systems	
440/1 Acorn Colour	£2299
440/1 Taxan 770+	£2518

**Techno 410/1 systems
upgraded to 420/1 spec.**

Acorn Colour system	£1459
Taxan 770+ system	£1699

Carriage £8/computer £12/system

TECHNO 410/40 UPGRADES

A410/1 upgraded to 4 MB RAM and 40 MB
Hard Drive complete with Mouse Mat, 1
box of 3.5" discs, printer lead and First
Word Plus Release 2.

Our 40 MB Hard Drive is a high spec, AutoPark,
25ms, quality drive with a reliable Toshiba
mechanism.

techno 410/40 with Acorn Colour Monitor	£1699
---	--------------

techno 410/40 with Taxan 770+	£1899
-------------------------------	--------------

Finance available on chargeable basis.

GENIUS DIGITISING TABLET

The latest model of the Genius GT1212A PC tablet adapted for use with Archimedes computers offers a resolution of 1000 lines/in over a 12" x 12" working area and connects through the serial port of the computer.

The Tablet is operated by moving a four button puck controller over the special surface and a two button stylus with switched tip is also available.

The software to drive the tablet is supplied as a module to operate within the RISC OS desktop environment. Once loaded, several commands are available to control the tablet:

- turn the tablet on or off
- select relative or absolute coordinates etc.
- change puck movement sensitivity

Three of the puck buttons act as standard mouse buttons and the fourth allows special operations such as changing the size of the tablet work area.

The tablet can virtually take over all the functions of a mouse making the use of graphics packages much simpler. The puck has a set of cross-wires which allow simple and accurate transfer of technical drawings. The optional stylus will make tracings, line drawings etc much easier and more accurate.

The standard Archimedes mouse or a Tracker Ball can be left connected and can even be used as alternatives for some operations.

The package includes the tablet, puck, software and mains power supply.

GT1212A Tablet	£259(a)
Optional Stylus	£35(d)

What we offer in addition to efficient sales service and professional backup!

We not only offer professional advice when you are purchasing your system but we will also provide friendly assistance afterwards. All our products carry a 12 month full warranty for parts and labour.

SPECIAL FINANCIAL DEAL

Computers alone or complete systems can be purchased over 9 months. The deposit will be payable with the order followed by 9 monthly payments. Please phone or write for full details and a personal quotation. Subject to status, we should be able to despatch your order within 7 days of receiving your order.

TECHNO 410/1 SPECIAL

Offer extended due to popular demand.
Archimedes 410/1 upgraded to full
440/1 specification with 4 MB RAM
and 50 MB Hard Disc (Acorn)

plus

Taxan 770+ Multisync Monitor
and including
a packet of discs, a printer lead
and a mouse mat.

for only **£1999** carr £12

Finance available on chargeable basis.

10% VOUCHER ON CASH & CREDIT CARD SALES

Cash and credit card purchasers of Archimedes computers and complete systems will receive a voucher to the value of 10% of the purchase price. Vouchers will be valid for 90 days from the date of issue. Vouchers are not available on Techno bundled packages.

TECHNO DTP PACKAGE

Archimedes 410/1 Colour
System upgraded to
full 420/1
spec with 2 Mb RAM and
20 Mb Hard disc
featuring our technoSCAN
package and either

Acorn DTP Package
First Word Plus Rel 2,
Logistix

or

Impression and Pipedream 3

and a free mouse mat
for only **£1777** carr £12

Finance available on chargeable basis.
Special Educational Subsidy on
the Techno DTP package.

R140 UNIX SYSTEM Limited Period Offer

R140 Base System
with
Taxan 770+ and PC Emulator
or
Viking II
plus
Ethernet Card and
Administrators Guide
for only
£3000

and it also includes on-site
maintenance contract.

A3000 LEARNING CURVE PACKAGE

with 1MB ACORN A3000
Tutorial Video
GENESIS Database
FIRST WORD PLUS
Wordprocessor
the parents guide to the national
curriculum
A3000 LEARNING CURVE
£699
Suitable monitor available
separately

TEL: 01 205 9558

For fast delivery please place
your order on 01-205 9558
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8UF.

Tel: 01-205 9558 Fax: 01-205 0190

Mon-Fri: 9.15-5.30. Sat: 10.30-4.00

All prices ex VAT.
Prices are subject to
change without notice.
Please add carriage
(a) £8.00 (Courier)
(b) £3.50
(c) £2.00
(d) £1.50

Archimedes SOFTWARE

LANGUAGES

ANSI C Rel 3 **£129(c)**
ISO PASCAL/FORTRAN 77 **each £95(c)**
PROLOG X/LISP **each £175(b)**
TWIN **£27(d)**
Archimedes Assembler **£185(b)**
Software Developer's Toolbox **£185(b)**
Software Developer's Debug Tool **£159(b)**
RISC BASIC Compiler (SV) **£85(c)**
Risc Forth **£85(c)**

UTILITIES

Clares Buffer Module **£18(d)**
Clares Toolkit **£15(d)**
Clares Toolkit Plus **£25(d)**
PC EMULATOR **£89(c)**
RISC OS Extras Disc **£5(d)**
SID Utilities Disc **£5(d)**
RISC Paintjet driver **£15(d)**

PRODUCTIVITY TOOLS

Desk Top Publishing
Acorn Desktop Publisher **£125(c)**
Impression **£129(c)**
Databases
Genesis **£79.99(d)**

WORD PROCESSORS

First Word Plus Release 2 **£75(c)**
Pipedream 3 **£129(c)**
Graphics Writer **£27(d)**

SPREADSHEETS

Logistix **£95(c)**
Sigmashet **£57(c)**

DATABASES

Multistore **£229(b)**
System Delta Plus **£57(c)**
Programmers Ref. Manual for above **£25(d)**
Reporter* **£33(d)**
Mailshot* **each £33(d)**
School Administrator **£125(b)**
**Requires System Delta plus*
Alphabase **£29(d)**
Ancestry **£60(c)**

ACCOUNTING

Order Processing/Sales Ledger **£54(d)**
Stock Manager/Purch. Ledger **£54(d)**
Nominal Ledger) **£54(d)**
Home Accounts **£41(d)**

COMMS PACKAGES

MAYA Terminal Emulator **£29(d)**
Hearsay **£55(d)**
Arc Comm **£29(d)**

EDUCATIONAL PACKAGES

Bumper Pack 1 - Reading **£17(d)**
Bumper Pack 2 -
Maths & Words **£17(d)**
Fun School 2 - Under 6's **£17(d)**
Fun School 2 - 6-8s **£17(d)**
Fun School 2 - Over 8s **£17(d)**

ART/GRAPHICS/CAD

Auto Sketch **£55(c)**
Pro Artisan **£80(c)**
Artisan **£30(c)**
Artisan Support Disc **£17(c)**
Render Bender **£59(c)**
Solids Render (SV) **£65(c)**
Arcol **£49(c)**
Atelier **£90(c)**
SV FilmMaker **£65(c)**
Gammaplot **£62(c)**
Robo Logo (SV) **£60(c)**
Presenter **£24(c)**
Presenter II **£39(c)**
SV Presentation Manager **£41(c)**
Solid Tools (SV) **£235(b)**
SV ARC-PCB **£167(b)**
SV ARC-PCB Professional **£319(b)**
SV SolidCAD NEW RISC OS ver. **£79(c)**
SV Solids Modeller NEW RISC OS ver. **£115(c)**
SV Gate Array Design System **£75(c)**
SV Realtime Graphics Language **£41(c)**
SV Super Dump (Arc) **£20(d)**
Super Plot **£20(d)**
Armadeus **£65(c)**
Graph Box **£65(c)**

EMULATED PACKAGES

View/Viewsheet/Viewstore **each £47(d)**
Interword/Intersheet **each £35(d)**
Wordwise **£20(d)**

GAMES

Zarch **£15(d)**
Conqueror **£24(d)**
Enthar Seven **£29(d)**
Hoverbod **£12(d)**
Missile control **£12(d)**
Minotaur **£9(d)**
Orion **£12(d)**
Freedy's Folly **£12(d)**
Jet Fighter **£12(d)**
Fugitive Quest **£26(d)**
Rise in Crime **£26(d)**
Overload **£26(d)**
Clares 3 Pack **£12(d)**
Thundermonk **£12(d)**
Pacmania **£16(d)**
Viking **£17(d)**
Corruption **£20(d)**
Terramex **£16(d)**
Fish **£21(d)**
Ibix the Viking **£17(d)**
Interdictor **£29(d)**
Casino **£21(d)**
Leader Board (Golf) **£26(d)**
Stranded! **£26(d)**
E Type **£17(d)**
E Type Designer **£17(d)**
U.I.M. **£26(d)**
The Pawn **£17(d)**
The Guild of Thieves **£26(d)**
Cops **£17(d)**
Plague Planet **£17(d)**
Trivial Pursuit **£17(d)**
White Magic 1 **£17(d)**
White Magic 2 **£17(d)**

technoSCAN

A versatile hand held scanner for Archimedes offering four monochrome resolutions (100, 200, 300 & 400 dpi) as well as having 4 different modes of operation to select grey scaled or monochrome images.

Software is fully integrated with the multi-tasking RISC OS and utilises the desktop environment to facilitate easy incorporation of scanned images into RISC OS compatible DTP, WP, art or drawing package.

The scanning area is 4" wide and vertical height is limited only by memory constraints. The image brightness is adjustable to obtain the optimum quality. Tone selector allows different settings for text and photos.

Software appears as an icon on the icon bar from where all its facilities can be accessed. Software features include:

Visual rescaling of either X or Y axis, X & Y flips, colour tinting, picture cropping, on screen help, etc. RISC OS's anti aliasing feature is utilised to enhance the image quality.

Scanned images can be saved as sprite file or dragged into other applications. The images can be output to compatible printer as a sprite using one of the RISC OS versatile printer drivers.

The manual is written in easy to follow style with hints and tips for getting the best results. The manual together with interactive on-screen help gets you going almost immediately you have installed the scanner.

technoSCAN complete with
interface card and manual **£149(b)**

MULTIPOD PROFESSIONAL

Professional design and use of latest hardware/software technology have enabled this five function podule to provide the highest quality performance at economical and realistic price. The five functions are:

FAST-SCAN VIDEO DIGITISER: Offers the highest resolution and number of picture levels of any video digitiser for the Archimedes computers. Capable of digitising in any mode to 640 x 512 pixels with 256 grey levels. Colour can be digitised with a camera and filters providing 24 bit colour resolution. Software operates within Desktop and offers contrast/brightness control, zooming, grey scaling and sprite saving.

SOUND DIGITISER: Samples for sound frequencies from 4KHz to 80KHz can be manipulated, composed and saved. Editing functions include filtering, mixing, overlaying, swapping, cut/paste. Saved sound modules including stereo sound samples can be used in various applications including games or can be exported to other sound packages. Operates within desktop environment.

SERIAL PORT: A full RS232 implementation of a dual channel comms port. It is IBM compatible using a 25way D connector. Uses *FX and SYS calls.

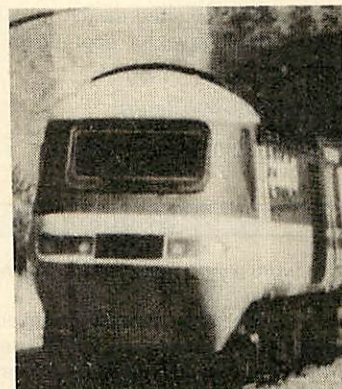
INSTRUMENTATION/JOYSTICK PORT: A high speed A to D convertor which provides samples at up to 100 KHz for versatile datalogging. As BBC B analogue port, uses the usual ADVAL commands.

ROM SOCKETS: 3 ROM sockets for use through built in BBC B RFS.

MULTIPOD PROFESSIONAL **£117(b)**

FILTER SET FOR VIDEO CAMERA (RGB) **£15(d)**

NEW MULTIPOD PROFESSIONAL FOR A3000 **£145(b)**



TEL: 01 205 9558

For fast delivery telephone
your order on 01-205 9558
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8UF.

Tel: 01-205 9558 Fax: 01-205 0190

Mon-Fri: 9.15-5.30. Sat: 10.30-4.00

All prices ex VAT.
Prices are subject to
change without notice.
Please add carriage
(a) £8.00 (Courier)
(b) £3.50
(c) £2.00
(d) £1.50

Archimedes EXPANSION

RAM UPGRADES

1Mb RAM upgrade (Acorn for A3000)	£179(b)
1Mb RAM upgrade (410/1)	£107(c)
2Mb RAM upgrade (420/1)	£209(b)
3Mb RAM upgrade (410/1)	£309(b)

FLOPPY DRIVE UPGRADE

3.5" Int Drive (305/310/410)	£118(b)
External Drive Adaptor (300/400)	£30(c)
External Drive Adaptor (3000)	£30(c)
External 5.25" Drive 40/80T, psu	£90(b)

I/O UPGRADES/EXPANSION

Acorn Backplane (2 slots)	£37(c)
TechnoLog Backplane (4 slots)	£29.95(c)
Fan for TechnoLog Backplane	£8(d)
I/O Podule	£80(c)
Midi Expansion Card	£66(c)
Midi Add-on to I/O	£37(c)
Acorn ROM podule	£51(c)
CC ROM Podule	£45(c)
IEEE Interface Card	£283(b)
16 bit parallel I/O Card	£195(b)
Dual RSa12 Card	£195(b)

Wild Vision Chromalock Board	£280(b)
Arc Prototyping Board	£35(d)
Tracker Ball for Arc	£47(c)

AEDA

External Drive Adaptor:

A versatile external drive adaptor offering many novel features:

- * Professionally designed for easy and neat installation.
- * Fully buffered and handles a total of 4 drives (3.5" or 5.25").
- * Rear panel mounted switch to select internal or external drive as boot drive. Particularly useful with PC programs.

AEDA for 300/400 Series	£30(c)
AEDA for A3000 (1 rear plate)	£30(c)

Genesis

A multitasking *hypermedia* system for all Archimedes which provides a framework for creating and accessing linked pages of information. Frames can contain text, in many styles, sizes and colours, graphics from Paint and Draw etc. 3D pictures, animation and music. Pages can be printed using standard RISC OS drivers.

**Special
Introductory
Offer**

£79.99(d)

A3000 4MB RAM CAPABILITY

The TechnoRAM Card for the A3000 with either 1MB or 3MB on board, allows you to expand up to 2 or 4MB. 1MB version upgradeable by us to 3MB.

1MB technoRAM £115(c)

3MB technoRAM £319(c)

HARD DRIVES & CONTROLLERS

Acorn 20Mb HD + Controller (310)	£379(a)
Techno HD Controller for 2 HD (310)*	£209(b)
SCSI HD Controller	£299(a)

Internal ST506 drives for 410 supplied complete with mounting bracket, cables & instructions

Techno 20Mb 40 ms	£179(a)
Toshiba 40Mb with Auto park 25 ms	£329(a)
Probably the best drive available.	

Auto parking for ease of use.

Techno 40Mb 28 ms	£299(a)
Techno 49Mb 28 ms	£369(a)
External ST506 HD as 2nd HD	
20Mb (cased & psu, cables)	£249(a)
40Mb (cased & psu, cables)	£359(a)
49Mb (cased & psu, cables)	£439(a)

Enquire on prices for SCSI drives

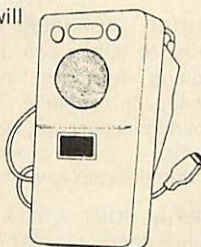
CABLES

Arc BBC Serial Link inc software	£15(d)
Arc BBC Serial Cables	£7(d)
Arc PC Serial Cables	£7(d)
Arc Parallel Printer Lead	£7(d)
Arc Keyboard Extn Lead	£7(d)
Arc Scart Lead	£7(d)
Arc/CM8833 lead with auto jack	£10(d)
Arc Dust Cover	£8.50(d)
High Quality Mouse mat	£4(d)

TRACKER BALL

A sturdy, high quality tracker ball is now available to replace the Archimedes mouse. You will no longer run off your mouse mat and at the same time you can save the valuable desk space. The tracker ball is fully compatible with the Arc mouse driver.

£47(c)



ARCHIMEDES NETWORKING

Use the hard disc on your 300 or 400 series Archimedes to provide storage for A3000s and 410/1 computers. They all connect to Acorn's Econet wiring using low cost Econet modules and ALL computers can run multi-tasking RISC OS applications.

Contact us for details

MONITORS

12", 14" and 20" MONITORS

Microvitec 1431AP	
Std Res + PAL/Aud, 14"	£199(a)
Microvitec 1455	
Med Res, 14"	£219(a)
Microvitec 1441	
Hi Res, 14"	£359(a)
Dust Cover for Microvitec 14" monitors	£5.50(d)
Philips CM 8833 14" RGB	
Med Res, 14", high contrast screen, TTL/Linear input, Mono/Colour Switch Stereo Sound Input, Separate controls for brilliance and contrast.	£239(a)
Acorn Philips	
14" Colour Monitor	£199(a)
TAXAN SUPER VISION 625	
12" Super Hi Res and contrast RGB Monitor with option to switch to mono BBC/IBM compatible.	£269(a)
TAXAN 770+	
MultiSync Autoscan 14", ideal for utilising the hi res modes on Archimedes. Our price includes a tilt & swivel stand	£419(a)
Taxan 770+ LR Row Radiation	£449(a)
TAXAN 870	
Multisync autoscan 16"	£595(a)
VIKING II	
19" Hi Res white screen monitor for CAD applications comes with Tilt & Swivel stand.	£849(a)

CM1686 16"	
Hi Res colour monitor for use with hi res modes on 400 series. Res: 1280 x 1024. Complete with Tilt and Swivel base.	£1249(a)

MONOCHROME MONITORS

PHILIPS 7502	
Hi Res green screen	£64(a)
PHILIPS BM 7522	
Hi Res amber screen	£68(a)

MONITOR ACCESSORIES

General purpose tilt and swivel stand for 12" and 14" Monitors	£12(b)
--	---------------

THINGI

Is Your desk cluttered?

Make some space by attaching a Thingi to your monitor. A removable copy holder at a down-to-earth price. Two models are available, to fit either on the left or the right of your monitor.

Thingi (state Left or Right) **£5(d)**

TEL: 01 205 9558



Orders welcome from
government depts &
educational establishments

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8UF.

Tel: 01-205 9558 Fax: 01-205 0190

Mon-Fri: 9.15-5.30. Sat: 10.30-4.00

All prices ex VAT.
Prices are subject to
change without notice.
Please add carriage
(a) £8.00 (Courier)
(b) £3.50
(c) £2.00
(d) £1.50

PRINTERS & PLOTTERS

EPSON

Epson LX/FX

Epson's budget priced 9 pin printers offer quality and reliability with Epson's advanced paper handling technology, draft and NLQ print in variety of typesstyles and fonts:

LX400 180cps draft 30cps NLQ	£149(a)
LX850 200cps superdraft 30cps NLQ	£209(a)
FX850 264cps draft 54cps NLQ	£329(a)
FX1050 as FX850 but wide carriage (132 col)	£409(a)

Epson LQ range

Epson's 24 pin printers with superior draft and letter quality, variety of typesstyles and fonts, high res graphics, advanced paper handling and Epson's reliability:

LQ400 180cps draft 60cps LQ	£224(a)
LQ550 180cps draft 60cps LQ	£299(a)
LQ850 264cps draft 88cps LQ	£465(a)
LQ1050 as LQ850 but wide carriage (132 col)	£589(a)

Epson Colour Printers

High speed 9 and 24 pin printers with colour option fitted:

EX800 300cps draft 60cps NLQ	£429(a)
EX1000 as EX800 but wide carriage (132 col)	£549(a)
LQ860 as LQ850 but with colour	£649(a)
LQ1060 Wide carriage version of LQ860	£759(a)
LQ2550 400cps draft 133cps LQ	£910(a)

Epson Inkjet/Laser Printers

SQ850 600cps draft 198cps LQ	£569(a)
SQ2550 as SQ850 but wide carriage (132 col)	£899(a)
GQ5000* Laser 6ppm multifont	£899(a)*
*Free 12 months on site maintenance included in the price)	
DPX5000 9pin Hi Speed Line printer 533cps	£999(a)

NATIONAL PANASONIC

KXP1081 + Master Printer Lead	£135(a)
KXP1124 24 pin 190cps draft 63cps LQ	£245(a)
KXP1540 24 pin 240cps draft 80cps LQ 132 col	£435(a)

STAR

LC10 9 pin 144cps draft 86 cps NLQ	£139(a)
LC15 as LC10 but wide carriage (132 col)	£289(a)
LC10 Colour version of LC10	£179(a)
LC24-10 24 pin 180cps draft 60cps NLQ	£219(a)
LC24-15 Wide carriage version of LC24-10	£349(a)
NB24-10	£409(a)

INTEGREX

132 Inkjet Colour Printer	£579(a)
---------------------------	----------------

HEWLETT PACKARD

Laserjet Series IIP	£849(a)*
Laserjet Series III	£1299(a)*



Deskjet Plus	£559(a)*
Deskjet	£469(a)*
Paintjet	£719(a)*
*FREE 12 months on site maintenance contract included	

PLOTTERS

ROLAND A3 8 pen FLATBED PLOTTERS		
DXY1100	£630(a)	DXY1300 £1085(a)
DXY1200	£915(a)	

BUFFERS & SHARERS

256K Auto Sharer/Buffers

This smart 256 buffer allows 2, 4 or 8 computers to share one printer. Auto scanning monitors input ports and downloads data into buffer, freeing the computer for other use. Buffer expandable to 1Mb. 25 way D female connectors.

PBS21/256 2 input 1 output	£149(b)
PBS41/256 4 input 1 output	£199(b)
PBS81/256 8 input 1 output	£289(b)

Smart Printer Buffer 256K

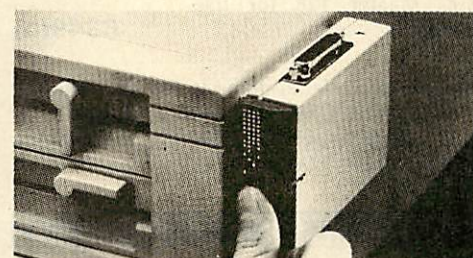
256K parallel buffer with facilities for 256 copies, PAUSE, RESET & SELF-TEST

£149(b)

Compact Two Way Switch

An economical solution for connecting two computers to one Printer or one computer to two printers. Easily attaches to the side of computer or monitor (specify parallel or serial)

£19(c)



Manual Printer Sharers:

(All lines are switched).	Parallel	Serial
2 computers to one printer	£23(c)	£23(c)
3 computers to one printer	£30(c)	£30(c)
4 computers to one printer	£36(c)	£36(c)
2 computers to 1 or 2 printers	£49(c)	£49(c)

Cable sets for above sharers available for all popular computers

BBC Computer Sharer: TCS26

1 computer to 2 printers fitted with BBC cable

£15(c)

Parallel Printer Leads

BBC/Master (1.2m)	£5(d)	BBC/Master (2m)	£7(d)
Archimedes (2m)	£7(d)	Compact (1.2m)	£7(d)
		Nimbus 2m	£7(d)
36/36way centronics (2m)			£9(d)
IBM/PC Compatible (2m)			£7(d)

CONSUMABLES

Serial Interfaces

Epson 8143	£32(d)
Nat Pan KXP17	£39(d)
Epson8148(8Kbuffer)	£79(d)
Taxan	£49(d)

Buffers

32K Buffer IC for P1124/1540	£18(d)
------------------------------	---------------

Cut Sheet Feeders:

LX400/800/850, LQ400/550	£69(b)
FX800/850, LQ800/850	£135(a)
LC10	£55(b)
LC24-10	£89(b)
Brother HR20	£209(a)
KXP1124	£88(b)
KXP1540	£179(a)

Full Tractor Feeds:

LQ800	£49(b)	LQ1000	£55(b)
LQ850	£70(b)	LQ1050	£85(b)

Guaranteed High Quality Ribbons

Epson:	
LX80/86/800,400/850	£3.50(d)
MX/RX/FX80/85/800/850	£3.50(d)
MX/RX/FX100, FX105/1000/1050	£5(d)
LQ400/550/800/850	£4.50(d)
LQ1000/1050, EX800/1000 (Black)	£7(d)
EX800/EX1000 Colour	£15(d)

Star:

LC10/NL10	£3.50(d)	LC10 Col	£5(d)
LC10 Colour			£6.50(d)
LC24-10			£5.00(d)

National Panasonic

KXP1081	£3.50(d)	KP1124	£6(d)
Taxan KP810/815/910/915			£5.00(d)
Juki 6100			£1.80(d)
Integrex Black Cartridge			£10.50(d)
Integrex Colour Cartridge			£16(d)

Plotter Pens:

Epson HI80 4 pen set (water/oil)	£7.50(d)
Hitachi 672 6 pen set: water	£18.50(d)
Oil	£25(d)

Roland 4 pen set. (water/oil) (various sizes)	£7.50(d)
EX800/EX1000 Colour Kit	£15(c)

PRINTER STAND

A new style printer stand with easy paper feed and paper separation, provides complete access to paper. Can be used with both top and bottom paper feed. Very space efficient.

£22(b)

MODEMS*

MIRACOM WS4000 V21/V23	£129(b)
MIRACOM WS3000 V22	£275(b)
MIRACOM WS3000 V22bis	£395(b)
PACE LINNET V21/23	£129(b)

*All models carry a BABT Approval

TEL: 01 205 9558

For fast delivery telephone
your order on 01-205 9558
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8UF.

Tel: 01-205 9558 Fax: 01-205 0190

Mon-Fri: 9.15-5.30. Sat: 10.30-4.00

All prices ex VAT.
Prices are subject to
change without notice.
Please add carriage
(a) £8.00 (Courier)
(b) £3.50
(c) £2.00
(d) £1.50

MASTER SERIES

Special Spring prices for Master Computer Systems

BBC Master Computer the most popular computer for education comes complete with a WordProcessor and Spreadsheet and fun/primary education packages.

BBC Master 128 with Acorn Colour Monitor, TS400 Single Drive & Epson LX400 printer

£720(2*a)

BBC Master 128 with Mono-chrome Monitor TS400 Single Drive & Epson printer

£649(2*a)

BBC Master 128 for use with TV

£349(a)

We can also offer systems to suit your specific requirements. Low cost finance available on above systems. Written quotations available on request. Subject to status.

MASTER ACCESSORIES/ADD-ONS

ADC06 Turbo 65C102 CoProcessor £115(c)

ADF10 Econet Module £49(c) Acorn Rom Cartridge £13(d)

ADJ22 Ref Manual I £14(c) ADJ23 Ref Manual II £14(d)

TRC32 32K RAM Cart. £15(d) Master Dust Cover £4.75(b)

BBC Domesday System £2,500(2xa)

ECONET ACCESSORIES

Stacking Filestore EOIS £899(d)

Filestore Hard Disc E40S £799(a)

Filestore Hard Disc E60S £999(a)

Econet Starter Kit £85(b)

Econet Socket kit £29(c)

File Server level II £75(d)

Econet Bridge £174(b)

PrinterServer Rom £41(d)

10Station Lead Set £34(d)

Master FS Utility Disc £17.25(d)

MISCELLANEOUS ACCESSORIES

Ripper Stripper

A handy gadget to obtain clean tear-offs from fan fold paper

£4.50(d)

Tidy Box

A moulded plastic pocket to store pens etc next to your micro.

£4(d)

Mouse Mat

High quality mouse mat which can also be used as a cutting pad (scales in inches and cm)

£3.50(d)

Mouse Cleaning Kit

An essential kit to ensure your mouse remains in perfect trim and provides precise operation

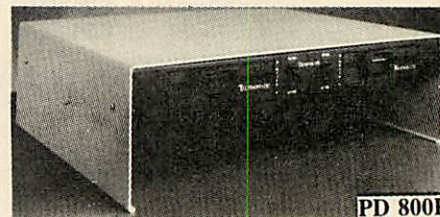
£4(d)

TECHNOMATIC DISC DRIVES

A range of high quality high performance drives to meet the needs of all BBC Micro Users.
*All drives are fitted with high quality slim line ultra lower power mechanisms capable of single and double density operation and offering fast track access and head setting times.
*5.25" floppy drives are fitted with 40/80 track switches as standard at no extra cost. The switches are located in the front and clearly marked to indicate the status at a glance.
*All drives fitted with all necessary leads and are ready for operation on unpacking. The drives with the mains power supply are supplied with a mains lead fitted with a suitably fused 13A moulded plug.
*Our plinth drives have been thoughtfully designed and provide a choice of two 5.25" drives or a combination of 5.25" and 3.5" drives.



TS 400



PD 800P

5.25" Single Drives 40/80 switchable:

TS400 400K/640K £80(b)

PS400 400K/640K with integral mains power supply £90(b)

5.25" Dual Drives 40/80 switchable:

TD800 800K/1280K £160(a)

PD800 800K/1280K with integral mains power supply £170(a)

PD800P 800K/1280K with integral mains power supply and monitor stand £185(a)

PS400/PS351 are Compact/Archimedes compatible.
PD800/PD352/PD853 are Archimedes compatible.

3.5" 80T DS Drives

TS351 single 400K/640K £69(b)

PS351 3.5" single drive with integral mains power supply in a 5.25" case. £95(b)

TD352 Dual 800K/1280K £126(a)

PD352 3.5" dual drive with integral mains power supply in a 5.25" case. £139(a)

Combo Drives (5.25" & 3.5" drives)

PD853 £185(a)

PD853 psu and plinth mounting £205(a)

WINCHESTER DRIVES

Most popular range of Winchesters for BBC. Drives are housed in metal casing fan cooled and powered by switch mode psu for quiet, efficient and reliable operation. Front end utility for Master, format and verify program and Tree Plan directory structuring utilities are included as standard.

P30HD drive £399(a)

P60HD drive £529(a)

P304HD + 40/80T DS Floppy £529(a)

3M FLOPPY DISCS

5.25" Discs in packs of 10

744 40T SSDD £5(d)

745 40T DSDD £5(d)

747 80T DSDD £7(d)

3.5" DSDD Discs £7.50(d)

BULK DISCS

50 5.25" 40T single sided discs with sleeves in lockable box. £20(b)

50 5.25" 80T double sided discs with sleeves in lockable box. £25(b)

40 3.5" 80T DS Discs in lockable box £38(b)

Drive Head Cleaning Kits (5.25" or 3.5") £4(d)

STORAGE BOXES

Library Cases:

10 x 5.25" £11(d) 10 x 3.5" £1(d)

Lockable Boxes:

3.5": 40 Discs £6(c) 80 Discs £7(c)

5.25": 50 Discs £6(c) 70 Discs £7(c)

100 Discs £8(c)

SPARE PARTS

BBC B/B+ Power Supply £65(b)

BBC B Keyboard £52(b)

BBC B Keyboard Connector £4.75(d)

BBC B/B+ Video ULA £18(d)

BBC B/B+ Serial ULA £12(d)

KeySwitch B,B+, M £1.75(d)

(please specify original type)

UHF Modulator £4(d)

16Mhz Xtal £2.50(d)

17.734 MHz Xtal £2.50(d)

6502A £5.50(d)

4816 RAM (B) £2(d)

Master psu £65(b)

Master Keyboard £62(b)

Keyboard Connector set (M) £5(d)

1Mb OS ROM M £39(d)

CF30060 ULA (M) £10(d)

CF30047 ULA £15(d)

ULA (512) £34(d)

ULA (6502 & Z80 2nd Proc) £28(d)

Power Supply (2nd Proc) £42(b)

ARC Keyboard Assy £85(c)

ARC Power Supply £65(b)

Mouse £49(c)

Drive Cable £5(d)

Keyboard Curly Cable £22(c)

Window Moulding £6(d)

41464 £8(d)

If the parts you need are not listed please call us

UPGRADES FOR MODEL B

Acorn 1772 DFS Kit £49(d)

ADFS ROM £26(d)

ATPL ROM/RAM Expansion Board £37(c)

TEL: 01 205 9558

For fast delivery telephone
your order on 01-205 9558
using VISA/Access Card



Orders welcome from
government depts &
educational establishments

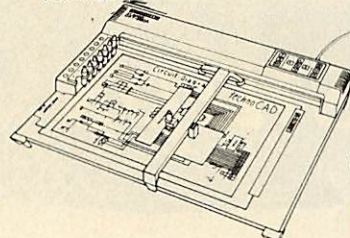
TECHNOMATIC

Techno House 468 Church Lane, London NW9 8UF.

Tel: 01-205 9558 Fax: 01-205 0190

Mon-Fri: 9.15-5.30. Sat: 10.30-4.00

All prices ex VAT.
Prices are subject to
change without notice.
Please add carriage
(a) £8.00 (Courier)
(b) £3.50
(c) £2.00
(d) £1.50



NOVACAD Computer Aided Draughting System

Novacad can drive a plotter to produce drawings of highest quality ... Novacad is excellent. It is flexible, genuinely easy to operate without much practice, and a pleasure to use.
Beebug Dec 86

A sophisticated CAD package with unique facilities. Thousands of Novacad packages are being used in widely differing fields ranging from industries for producing engineering drawings to accountants' offices for producing flow charts. Architects, engineers, plumbers, kitchen planners and many other professions requiring easy to use facilities for producing high quality output are making extensive use of Novacad's unique features. Novacad is proving to be an invaluable teaching aid in technical schools simply because of the ease with which it can be used.

Novacad is compatible with all models fitted with Acorn DFS. Hardware requirements can be minimum; single drive and FX80 compatible printer are enough to get started, though its performance is enhanced considerably by use of 6502 2nd processor, dual drive and to a degree with B+ and Master's shadow ram.

The major features offered are:

- ★ Simple and easy to use with logical command sequence.
- ★ A large drawing area (approx 15 screens)
- ★ Unique ability to create complex icons made up of upto 500 lines instead of the usual 15 to 20 pixels, store them in a library and recall them at different scales and orientations.
- ★ Zoom facility.
- ★ Create multi level drawings.
- ★ Text entry at any 90° orientation anywhere on the screen.
- ★ Grid scaling and locking, displacement measurements.
- ★ Printer routine for FX80/100 compatible printers.
- ★ Cursor control from keyboard/tracker ball/mouse.

Plotter driver generator available as an optional utility, configures a routine for any BBC compatible plotter. Pre configured routines for popular plotters like Epson H180, Hitachi, Plotmate are included. Drawings can be scaled to maximum plotter size.

NOVACAD T/M Version **£39(d)**
NOVACAD T/M + Plotter DG **£49(c)**
Plotter Driver Generator **£12(d)**

WHY technoCAD?

The best feature of technoCAD is not its outstanding performance, not its unique ability to allow creation of complex icons, not the quality of output from printers or plotters. The best feature is the unprecedented ease with which it can be mastered. With easy to use single key commands limited to three keys, pull down menus and a clear and concise, easy to read manual, technoCAD is truly the system any one can use.

technoCAD will meet the needs of most professional applications and it is an ideal tool for teaching CAD in technical schools, CDT departments and colleges. **£99(c)**

BBC SOFTWARE

INTEGRATED PACKAGES

MEGA 3 ROM	£76(c)
(incorporates InterWord/InterSheet/InterChart)	
MINI OFFICE II	
Disc for B & B+ (40T)	£14(b)
Disc for Master	£16(d)
Disc for Compact	£19(d)

WORDPROCESSORS

Acorn VIEW 3.0	£45(c)
Wordwise	£24(d)
Wordwise plus	£38(d)
Interword	£36(d)
Spell Master	£42(d)

DATABASES

Viewstore	£36(d)
InterBase	£49(d)

SPREADSHEETS

Viewsheets (ROM 8, B+)	£36(d)
Viewsheets (Disc Compact)	£39(d)
Viewplot	£24(d)
InterSheet	£37(d)
InterChart	£25(d)

LANGUAGES

Acornsoft C	£29(d)
Acorn MicroProlog	£49(d)
150 PASCAL	£51(c)
MicroText	£52(c)
MicroText plus	£229(b)

POINTING DEVICES

Marconi Tracker Ball RB2	
RB2 Stand Alone	£49(c)
(specify if AMX compatibility reqd)	
RB2 + ICON Master	£59(c)
RB2 + Pointer ROM (M)	£59(c)
Stand Alone Mouse	£34(c)
(AMX Compatible)	
Mouse Pocket	£3.50(d)
High Quality Mouse Mat	£4(d)

UNIVERSAL DEVELOPMENT SYSTEM

A set of three packages to meet the needs of any software developer for assembling, disassembling and amulating codes for over 30 processors. Packages are structured to work with new processors.

META Assembler	£90(c)
TEAM Disassembler	£90(c)

COMMUNICATIONS

Master Termulator (M)	£32(d)
MAYASOFT (A,M,C,B,B+)	£29(d)

PRINTER UTILITIES

DumpMaster ROM	£26(d)
Screen Print (B/W)	£25(d)
Screen Print (Col)	£35(d)
(state Star or Integrex)	
PrintMaster	£24(d)

TEL: 01 205 9558

When you're talking COMPUTERS talk to Microsnips

Whatever your needs, we have over 3,600 different computers and accessories in stock – all backed by the knowledgeable, highly professional service that has made us one of the most respected computer dealers in Britain.

So whether you're looking for hardware, software or just some expert free advice, consult the Computer specialists.

Talk to Microsnips.

CABLES

MCL005 (1 Metre) Attenuated 7 Pin Din Plug. 2 x 3.5 mm Jack Plugs. 1 x 2.5 mm Jack Plug (Metal Plugs) BBC-Electron Computer to Cassette Recorder	£4.95
MCL029 (2 Metres), 24 Way Centronics Plug to 36 Way Centronics Plug. Printer Cable for BBC Master Compact.	£13.95
MCL060 (1 Metre) Ribbon Cable, 26 Way IDC Socket, 26 Way Centronics Plug. BBC Computer to Centronics Printer.	£8.95
MCL061 (2 Metres) Ribbon Cable. 26 Way IDC Socket, 36 Way Centronics Plug. BBC to Centronics Printer.	£9.95
MCL136 (2 Metres) Plastic Phono Plug, Plastic Coax Plug, Replacement Computer to TV Cable.	£1.95
MCL101 (1 Metre), 7 Pin Din Plug to 7 Pin Din Plug. BBC/Electron Computer to Cassette Recorder.	£2.95
MCL106 (1 Metre) 7 Pin Din Plug, 2 x 3.5 mm Jack Plug/1 x 2.5 mm Jack Plug. BBC/Electron Computer to Cassette Recorder.	£3.95
MCL136 (2 Metres), BNC Plug. Phono Plug. BBC/Electron Computer to Monochrome Monitor	£3.95
MOD106 (2 Metres), 5 Pin Domino Plug, 25 Way D Plug. BBC/Electron Computer to Modem. This cable is for general use on various modems.	£5.95
MASTER COMPACT to 3.5" & 5.25" drives. 25 Way D Plug to 25 Way D Socket + 34 Way IDC Plug.	£17.95
MCL342 Archimedes to BBC Computer – Serial Cable 9W D to 5 Pin Domino.	£6.95
MVDU-121 Archimedes/Scart.	£7.95
MVDU01 (2 Metres), 6 Pin Din Plug, 6 Din Pin Plug, BBC/Electron computer to Microvitec RGB Monitor.	£3.95
MVDU05 (2 Metres), 6 Pin Din Plug, Scart Plug, BBC/Electron Computer to Scart Television.	£5.99
Note: TV must be switched to AV mode.	

MVDU45 (2.5 Metres) Coiled Cable, 6 Pin Din Plug, 7 Pin Din Plug. BBC/Electron Computer to Ferguson MC01 Monitor.	£3.95
MVDU52 (2.5 Metres) Coiled Cable, 6 Pin Din Plug, 7 Pin Din Plug. BBC/Electron Computer to Hitachi CT 1444 Monitor.	£3.95
MVDU103 (2 Metres), 6 Pin Din Plug, 8 Pin Din Plug, BBC/Electron Computer to Philips colour monitor.	£3.95

Amazing Amiga A500 Offer!

Includes: Mouse – Handblaster Joystick – 5 3½" disks – Mouse mat – plus over £200 worth of free software titles comprising 10 top titles – **PLUS** T.V. modulator while stocks last. **£399**. Worth over £625 if bought separately.

Disk discount!

100 high quality bulk 5¼" DSDD disks
With FREE lockable disk box to store them in. Money back guarantee.
Only **£35.95**

World's no. 1 3½" disk
(Memcon report). TDK MRP £33.95 for 10 **£14.50** for 10 (introductory offer).

25 high quality bulk 3½" DSDD disks
With FREE lockable disk box. Money back guarantee. **£26.95**

Star buy! Only £299 + VAT

Normally £399.95 + VAT the Star LC24 10 multi-font 24 pin printer offers: 170 CPS draft – 7k buffer – automatic paper advance – revolutionary paper parking facility – **PLUS** 1,000 sheets.

RING 051-630 3013 TO ORDER
or for **FREE CATALOGUE**
Answerphone 6.00 p.m. – 9.00 a.m.

OVERSEAS CUSTOMERS NOTE
Postgiro International accepted. NOT
Postbank Postcheque. Books not taxable –
Europe add £5. Non Europe add £10. We
reserve the right to charge carriage at cost.

UK POSTAGE AND PACKING. Items under
£50 add £2. Items under £100 add £5. Items over
£100 add £10 for Group 4 Courier ensuring
delivery the day after the despatch. Overseas
customers (Europe): Full price shown will cover
carriage and free tax. Non Europe add 5% to total.



MICROSNIPS

Making technology work for you!

37 SEAVIEW ROAD, WALLASEY, MERSEYSIDE L45 4QN 051-630 3013 051-630 5396 051-691 2008 FAX: 051-639 2714

Archimedes & A3000 Owners!

Quite a few Archimedes owners are apparently unaware of *Archive Magazine* and the various services that Norwich Computer Services provide.

- **Archive Magazine**, now in its third year, provides vast quantities of information about Archimedes computers. (£17 for 12 issues each approx 60 pages A5.)
- **Archive Bulletin Board** keeps you in touch, on a day-to-day basis, with what is happening in the world of Archimedes. (01-683-0629, scrolling, 8n1, up to 2400)
- **Archive Shareware / Careware discs**. We have a range of 25 discs of public domain software from various sources. Many of the discs contain several quite substantial programs for as little as £3.50 per disc.
- **Members' Discounts** (up to 15% or more) are available on both software and hardware. A single purchase of a £150's worth of software or hardware could save you the cost of a full year's subscription.

If you would like more details please let us know by letter, phone or fax.

Norwich Computer Services

18 Mile End Road, Norwich, NR4 7QY. (0603-507057 / Fax 250095)

NOW FOR RISC OS A LOW COST DISC BASED PROFESSIONAL ACCOUNTING PROGRAM

"MICRO-TRADER"

INTEGRATED SALES PURCHASE AND NOMINAL LEDGERS

Turn any BBC Computer from the humble Model B to the latest Archimedes into a fast, powerful business tool. "Micro-Trader" can provide easy to use and timesaving computer accounts for businesses with a turnover up to £21 million per year.

Designed for business use by a business man, "Micro-Trader" offers full Sales and Purchase Ledger facilities including SALES INVOICE and STATEMENT PRINTING with a capacity of up to 1,000 accounts and 5,000 transactions per month.

Nominal Ledger features quick and easy entry of everyday transactions. Up to 6 Bank Accounts, full V.A.T. facilities, Journal Posting. Full Reporting for individual accounts, Audit Trail, Trial Balance, Profit & Loss and Balance Sheet.

"MICRO-STOCK"

Stock Control program, fully integrated with "Micro-Trader". 4,000 Stock Items with user defined Codes. Invoice and Credit Notes and Cash Sales routine. Full Stock Held Reports.

£75.00 + V.A.T.

"EXTENDED PAYROLL"

Micro-Aid Full Feature Extended Payroll. For use stand alone or integrated with "Micro-Trader".

£49.95 + V.A.T.

"MICRO-MAILER"

A Mailmerge program, fully integrated with "Micro-Trader". With a user Database.

£30.00 + V.A.T.



ARCHIMEDES

Improved program for RISC OS features faster searches, larger capacity and improved analysis facilities.



PHONE TODAY FOR A FREE FACT SHEET

MEADOW COMPUTERS

11, LONDON STREET, WHITCHURCH, HAMPSHIRE, RG28 7LH

Telephone: Whitchurch (0256) 892008



Portobello Trading Company



Trade in your working BBC B and we will offer £125 or more against any other popular micro

Acorn Master 128	£499
Acorn Archimedes A3000	£746
Acorn Archimedes 400 series	from £1378
Atari STFM and new STE	from £299
Amiga A500	£399

A wide selection of Second hand micros and peripherals for sale.

(please phone for current stocks)

Authorised Acorn Dealer

298-302 Portobello High Street

Edinburgh EH15 2AS



Tel: (031) 657 3941 (3 lines)

Fax: (031) 657 2988



Watford Electronics

Jessa House, 250 Lower High Street, Watford WD1 2AN, England

Tel: Watford (0923) 37774 Tlx: 8956095 Fax: (0923) 33642

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.

All prices exclusive of VAT; subject to change without notice & available on request.

Credit Card Orders (ACCESS & VISA) Tel (0923) 33383 or 50234 (24 Hours)



The choice
of Experience



The choice
before and after
the experience

Archimedes *micro*

System Basic Mono Colour Multiscan

Please telephone or write in
for our
NEW LOW PRICES

(Securicor carr. £10 on Archimedes)

Archimedes A3000

- A3000 Microcomputer £599
- A3000 + Learning Curve pack £699
- 3.5" External Drive £99
- Dust Cover Micro only £5
- Monitor Stand £22
- Dust Cover for Micro + Monitor £9
- External Podule Case £14
- User port/MIDI upgrade £49
- Serial Upgrade £19

12
MONTHS
FREE
MAINTENANCE
ON SITE

NEW A3000 LEARNING CURVE

A very special offer pack consisting of the remarkable A3000 Archimedes microcomputer, Integral disc drive and a mouse. Welcome guide and user manual. A pair of application disc containing Painting package, Drawing Application, Text and program editor, Music package, Games & Utilities programs. First Word Plus wordprocessor and spelling checker, IBM PC Emulation package, Genesis applications, which contains: GEN DTP, Address & phone book, Scrap book, Recipes, Composers, Green issues, Planets, Story writing and Personal organiser. A demonstration Video Cassette and A parent's guide to the National Curriculum. All this plus Watford's incredible deal of a FREE upgrade to 2MB of RAM and FREE on-site maintenance cover for 12 months.

ACCESSORIES

- NEW Multitasking RISC OS £29
- MEMCI Upgrade £49
- ARM 3 Upgrade £399
- ROM Podule Acorn £45
- ROM Podule (Computer Concepts) £45
- ROM Podule (C C) with Battery Backup £59
- 2 Podule Backplane (Watford) £25
- 4 Podule Backplane (Watford) £35
- Backplane FAN only (for Hard Disc) £8
- 3.5" 800K 2nd Floppy Drive (305/310) £118
- 5.25" 800K external Floppy Drive £85
- I/O Podule (with Analogue port, User port, & 1MHz bus) £80
- MIDI add-on to I/O Podule £29
- MIDI Expansion Card £65
- Clares Armadeus Sound Sampler Board £129
- Sound Sampler Mono (Armadillo) £166
- Sound Sampler Stereo (Armadillo) £186
- Chromalock Podule (Wild Vision) £275
- Econet Network Board £46
- Archimedes IEEE Interface Adaptor £269
- Dual RS232 Podule £195
- 16 bit parallel I/O Card £195
- NEW - Archi MK II Replacement Mouse £39
- RB2 - An Archimedes Marconi Tracker Ball £47
- PC Emulator (RISC OS) incl. MSDOS 3.21 £62
- Software Developers Toolbox £159
- Floating Point Unit £549
- SCSI Adaptor Expansion Card £185
- Archi Real-time Digitiser £249
- Keyboard Extension Lead £6

Archi Books, see page 12 of our advert

0% FINANCE

We are once again able to offer 0% finance for the purchase of an Archimedes or BBC Master micros and some peripherals. For further details please write in or telephone: 0923 37774 ext. 223, 203 or 201

Unbeatable SPRING SALE

Offers on Archimedes Micro
(Extended by Popular Demand)

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

Micro Free Offer

- A410/1 Upgraded to 2MB RAM & a 20MB Hard Disc, worth £299 (A420)
- A420/1 Upgraded to 4MB RAM & a 40MB Hard Disc, worth £679 (A440)
- A440/1 A TAXAN 770+ 14" Multisync Monitor
- A3000 Upgraded to 2MB, worth £159

Plus 12 months FREE On-Site Maintenance

Turbo Charge Your Archimedes

(at an affordable price)

Increase the speed of your Archimedes by a factor of THREE to SIX times (depending on the software you are running), with Watford's ARM3 Upgrades.

- ARM-3 20MHz Upgrade £349
- ARM-3 30MHz Upgrade £399

Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

- UP10 - to 2MB RAM + 20MB Hard Disc £265
- UP15 - to 2MB RAM + 40MB Hard Disc £359
- UP20 - to 4MB RAM + 20MB Hard Disc £475
- UP30 - to 4MB RAM + 40MB Hard Disc £569
- UP40 - to 4MB RAM + 53MB Hard Disc £649

(P.S. When purchased with an A410/1, the upgrades will be fitted at no extra cost)

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required.

- R302-A3000 - to 2MB RAM Upgrade £115
- R304-A3000 - to 4MB RAM Upgrade £349
- R311-A305 - to 1MB RAM Upgrade £99
- R312-A305/310 - to 2MB RAM Upgrade £285
- R314-A305/310 - to 4MB RAM Upgrade £499
- R412-A410/1 - to 2MB RAM Upgrade £109
- R414-A410/1 - to 4MB RAM Upgrade £319

(Carriage on Add-ons £3)

Watford's 20Meg & 40Meg Archimedes Hard Disc

Watford Electronics' 20Meg & 40Meg hard disc fits internally into the Winchester slot provided. It is fully compatible with Acorn's hard disc upgrade, (the only difference is our low price). Price includes the Hard Disc Drive, Controller Podule & fitting instructions. (Self parking hard drives.)

P.S. The 310 upgrade requires a backplane and a fan.

- 3HDP - Hard Disc Podule only £175
- 3HD20 - 20Meg H' Disc + Podule for 310 £319
- 3HD40 - 40Meg H' Disc + Podule for 310 £439
- 2 Podule backplane (Watford) £25
- 4 Podule backplane (Watford) £38
- Fan for the backplane £8
- 4HD20 - 20 Meg Hard Disc for 410 £169
- 4HD40 - 40 Meg Hard Disc for 410 £285
- A3000 Hard Disc Podule only £195
- A3000 20 Meg Hard Disc + Podule £369
- A3000 40 Meg Hard Disc + Podule £489

(Carriage £7)

Desk Top Publisher

- Acorn's Archi DTP Package £125
- Impression DTP Package £135

WORDPROCESSORS

- Wordwise + Disc £20
- Image Writer £25
- Interword Disc £20
- 1st Word Plus - 3 £72
- Archie Spell Master £39
- P. Spellchecker View £40
- Viewspell £45
- Viewindex £32
- Graphic Writer £12
- £23

DATABASES

- AlphaBase £36
- Viewstore £45
- Interbase Disc £20
- Multistore £195

SPREADSHEETS

- Intersheet Disc £20
- SigmaSheet £55
- Viewsheets £45

BUSINESS GRAPHICS

- GammaPlot £50
- Interchart Disc £20

INTEGRATED PACKAGES

- Logistix - Database, Spreadsheet, Time Management & Business Graphics £89
- Pipedream 3 - Wordprocessor, Database & Spreadsheet £125

(P&P on above £2)

GRAPHICS, ART, DESIGN & GAMES

- GRAPHICS**
- Atelier £84
- Pro Artisan £85
- Archeffect £20
- Autosketch II £75
- Graph Box £64
- Kermit £46
- Linguinity £39
- Presenter II £59
- Render Bender £59
- Holed Out Golf £17
- Hyperpack (12) £79
- Hoverbowl £11
- Ibix the Viking £14
- Inter Dictor £25
- Jet Fighter £10
- Minotaur £11
- Missile Control £11
- Orion £12
- Pacmania £14
- Repton 3 £17
- Thundermonk £11
- Zarch £15
- GAMES**
- Alerion £11
- Arcade Soccer £17
- Clares 3 Pack £12
- Conqueror £19
- Enthar Seven £22
- E-Type £17
- E-Type Designer £15
- Freddy's Folly £10
- Holed Out Designer £17
- Miscellaneous**
- Arc TFS £25
- Toolkit (Beebug) £32
- Toolkit (Clares) £42
- Hearsay Comms £55
- Genesis £70

SILICON VISION Corner

- Data Vision £74
- Gerber Plot £93
- Risc Basic £74
- Solid CAD £74
- Super Plot £20
- Super Dump £20
- Arc PCB Professional £275
- Gate Array Design System £67
- Financial Accounts £129
- Realtime Solids Modeller £110
- Film-Maker £59
- Office Tools £219
- ROBO LOGO £54
- Share Holder £74
- Solids Render £59
- Solid Tools £199

LANGUAGES (Archimedes)

- ISO-PASCAL; FORTRAN 77 £89 each
- ANSI C Release 3 £129
- Assembler; LISP or Prolog X £155 each
- LOGOTRON LOGO £55
- ROBO LOGO £56
- RISC BASIC £85
- TWIN EDITOR £25
- BASIC Compiler £89

(P&P £2 on above packages)

MINERVA's Archimedes Software

Sigmasheet	£55	Sales Ledger*	£53
Home Accounts*	£40	Purchase	
Stock Manager*	£53	Ledger*	£53
Nominal Ledger*	£53	Reporter	£29
Ancestry	£59	Mailshot	£29
Gammplot	£50	MultiStore	£195
System Delta+	£55		
System Delta + Reference Manual			£25
Order Processing/Invoicing*			£53
School Administrator			£118
* Requires System Delta			
(P&P on above items £2)			

Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

New RISC OS Version **Only £15**

Archimedes 5.25"/3.5" Disc drive Interface

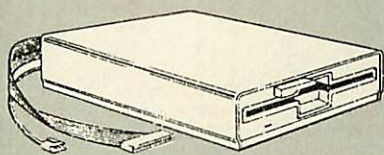
With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Up to 4 disc drives can be connected. NO SOLDERING is involved. Supplied complete with necessary lead.

Only £21

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheets, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) **£439 (carr £7)**

FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics, Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control.

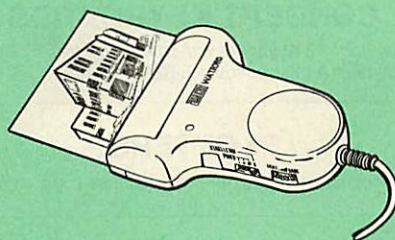
FREE with every BBC Master purchased from us during April

ADD-ONS & ACCESSORIES

Turbo 65C102 Add-on Module	£115
Econet Module for the Master	£47
Twin ROM Cartridge for Master	£9
Quad ROM Cartridge for Master	£14
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref Manual	(No VAT) £17
64K Upgrade Kit for B+	£32
Acorn 1772 DFS Kit complete	£49
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238
Morley Teletext Adaptor with ATS Rom	£99
Filestore E01S	£899
Filestore E40s	£749
Filestore E60S	£949
Ecolink	£270

(Carr. £2 to £7 depending on the weight)

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system. The package includes the most comprehensive utility software available for the Archimedes, a high quality, ergonomically designed to fit the shape of your hand, (see drawing above) scanner, which is fitted with a warning LED that will indicate if the scanner is being moved too quickly for accurate results. Additional twin guide rollers ensure precise tracking over the image, to make the best use of the high resolution available with this system. The yellow/amber illumination of our Mk II scanner, enables you to achieve optimum accuracy. It is capable of scanning up to an amazing 400 DPI. The scanning area is 4" wide and the height is only limited by the maximum amount of memory available.

On board ROM software supplied, is the most sophisticated Archimedes scanner software yet written.

Price £149 (P&P £4)

Special Discount Scheme

For Teachers, Lecturers & Education.
Please phone for further details.

Z88 Portable Micro



Only: £195 (Carr £4)

FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

ACCESSORIES

32K RAM Pack or 32K EPROM Pack	£18.00
128K RAM Pack or 128K EPROM Pack	£45
512K RAM Pack	£175
Z88 Eprom Eraser Unit	£35
Z88 Spellmaster for Pipedream	£51
Z88 Carrying Case	£9
Z88 Computing Book	£9.95
AA Nicad Rechargeable Battery	£1.50
Battery Charger Compact & Fast	£6
Z88 Serial Printer Cable	£9
Z88 Parallel Printer Cable	£25
● Z88 to BBC Link	£20
● Z88 to PC Link II	£30
● Z88 to Macintosh	£52
● Z88 Mains Adaptor	£9
● Z BASE	£56
● Z TAPE	£42
● Z TERM	£42
● Z88 Modem	£149

By popular demand, we are now supplying refurbished and fully guaranteed BBC Micros with Disc Filing System

(Please telephone for price & availability)

Extended Finance Available

We are able to offer low cost finance to all our customers, including 0% finance on certain items. For further details please refer to page 9, column 3 of our advert.

ULTIMUM – Archimedes A3000 Podule Racking System

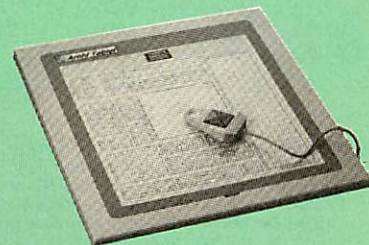
When Acorn originally designed the Archimedes micro, they released to all interested parties the specification of the expansion podule. This has now become the accepted standard for all manufacturers of Archi peripherals. The A3000 & A4000 both allowed expansion internally up to 2 or 4 podules. However, a newcomer to the affray has caused some upset. A3000 has only a single podule expansion slot, on the outside. There has been deliberation in the industry about a controversial "mini-podule" to be fitted to a special rack. This would entail a re-design of all the available podules onto a smaller board and understandably the manufacturers have rejected the idea completely. As always, Watford have come up with the only real solution to the A3000 expansion problem. The Ultimum Podule Racking System allows up to 3 full size standard A3000/A4000 series podules to be fitted to the computer. There is also provision for a hard disc drive and podule. Ultimum has its own PSU. There is also an IEC mains output socket for a monitor. It mounts on top at the rear of the computer, and allows direct access to the floppy drive and reset button, rather than obstructing access as on other non standard systems.

Watch this space for launch details.

FREE On-Site Maintenance

This month we are also offering at no extra cost to all our customers, 12 months, On-Site Maintenance on all Archimedes Micros, Philips, Microvitec, and Multiscan COLOUR Monitors. Also on the full range of Panasonic Printers. Should your machine fail, simply telephone the maintenance engineer, who will call in within 12 working hours to repair the unit. (P.S. This offer is over and above our Unbeatable Winter Sale Offers on Archimedes Micros). (Offer applicable only when bought at prices advertised in this advert).

Archi Graphic Tablet



This package allows Archimedes users to take advantage of the low cost graphpad (sometimes called a digitiser tablet, but not to be confused with a video digitiser!)

The Archi Graphpad offers performance and accuracy comparable to other graphics tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely.

The software, which is in the form of a relocatable module (RM), intercepts the system calls which control the mouse, and so allows virtually all mouse based Archimedes software to be controlled using the tablet without any modification. The only exceptions are programs which use the serial port, as the tablet is physically connected to this port itself.

The software is supplied with a special adaptor lead to connect the tablet to the Archimedes' serial port, and a power lead which plugs onto the Archimedes' main board.

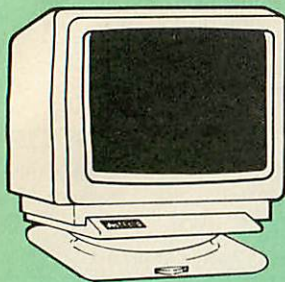
(For further details, please telephone or write in for our FREE catalogue.)

Special Price £249 (carr. £4)

(Price includes Tablet, Leads & Software)
Stylus Optional Extra £29

Continued → → → → → → → → → →

MONITORS



12 months
FREE
maintenance
on site

MICROVITEC 14"

- 1431 - Standard resolution as used on the BBC television computer programme £175
- 1451 - Medium resolution, suitable for word processing in mode 0 £219
- 1455 - MS Medium resolution, ideal for Archimedes £220
- 1441 - High res, exceeds the capabilities of the BBC Micro £359
- 1431AP RGB + PAL and AUDIO £199
- 1451AP RGB + PAL and AUDIO £255
- 2030 CS 20" Med Res £380
- 2040 CS 20" Hi Res £675
- Dust Cover for Microvitecs £5.50
- Touchtec 501 Touch Screen £239

14" MULTISCAN COLOUR

- TAXAN 775 Plus - 0.28 Dot pitch Ultra high resolution, anti-static screen £399
- TAXAN 770 LR Low Radiation, auto-scanning Ultra High Res £429
- TAXAN Multiscan 870 16" Monitor £575
- TAXAN Viking 19" Paper White, High Resolution (1152 x 896 with Archi 400 series) £799
- EIZO 8060H - For technical info. read the review in Micro User, Jan. '89 £389
- EIZO 9060SZ Low Radiation, Super High Resolution, Antistatic screen, multiscan monitor for a wide range of applications. 800 dots x 600 lines. Display for high res VGA. 0.28 Dot pitch £469

TAXAN 12"

- Super Vision 3 - Type 625 Super Hi-res RGB Colour, Green/Colour Switch £269

PHILIPS

- BM7502 12" Hi-res Green Monitor £70
- BM7522 12" Hi-res Amber Monitor £71
- CM8833 14" Med. Res Colour Monitor £215

STAR BUY

- PHILIPS 14" Medium Res, dark glass, attractively finished Colour Monitor - supplied complete with RGB, SKART and Audio/Phono inputs. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £189

Dust Cover for Philips Monitors £6
(Securicor carriage on Monitors £7)

SWIVEL BASES

By simply placing your monitor on one of our front adjustable professional swivel bases (see drawing at the top), you can easily adjust the monitor viewing angle.

for 12" Monitors £8 (carr. £2.50)

for 14" Monitors £12 (carr. £2.50)

Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

Price £12

SPARE LEADS

- BNC Lead for Zenith or Philips £3
- Skart Monitor Lead £5
- RGB lead for TAXAN Monitors £3
- Archimedes Colour Monitor Lead £7.50

CONCEPT KEYBOARDS

- Standard A3 Keyboard with BBC Software £143
- Standard A4 Keyboard with BBC Software £117

PLOTTERS

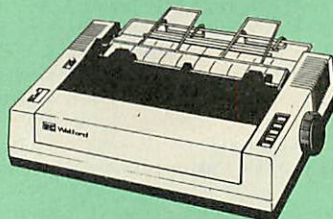
- Plotmate A4S £379
- Plotmate A3M £549

Roland Plotters

(Official Roland Appointed Distributor)

- DPX 2500 POA £595
- DXY 1200 £835
- DXY 1100 £595
- DXY 1300 £1015

Panasonic KX-P1081



12
MONTHS
FREE
MAINTENANCE
ON SITE

SALE OFFER only: £127

(Price includes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us)

KX-P1180 Printer Offer

Panasonic KX-P1180 printer, Dump Out 3, Screen Dump ROM & a BBC printer lead.

Offer Price £136

Panasonic Printers

- KX-P1124 24pin 80col. 192/63 CPS £219
- KX-P1540 24pin 136col. 240/80 CPS £425
- KX-P1592 9pin 136col. 216/45 CPS £275
- KX-P1595 9pin 136col. 288/61 CPS £345
- KX-P1624 24pin 132col. 192/63 CPS £349
- KX-P1695 9pin 132col. 330/861 CPS £349
- KX-P4420 NEW 8PPM Laser - Launch Offer £999

● Panasonic KX-P4450i LASER PRINTER

Latest technology at Watford's special offer price

- Spare Toner £29
- Drum Unit £149
- 1MB RAM Upgrade £299
- 2MB RAM Upgrade £585
- A4 Feeder £55
- Developer £115

Panasonic Accessories

Cut Sheet Feeders

- KX-P1592/1595 (P32) £175
- KX-P1124 (P36) £85
- KX-P1540 (P35) £175
- KX-P1180 (P37) £79

BUFFERS

- P12 4K buffer Board for 1081 £55
- P42 32K buffer Chip for 1592/1595 £16
- P43 32K Buffer Chip for 1540/1124/1180 £16

Serial Interfaces

- P17 P1081/1592 £32
- P19 P1124/1180 £55

Original Panasonic Ribbons

Guaranteed to last 3 million characters

- P110 for KX-P1081, 1592 & 1595 £8
- P115 for KX-P1180 £8
- P145 for KX-P1124 £8
- P140 for KX-P1540 £10
- Colour Ribbons for KX-P1081, 1592 & 1595 £9.95 each
- Brown, Blue or Red

INTEGREX COLOUR JET

- Colour Jet 132 Printer £515
- Paper Roll £6.50
- Screen Dump Software £10
- Colour Cartridge £19.50
- Black Cartridge £11.25
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123

Citizen Printer Swift 24 £249

NEC P2 Plus Pinwriter £279

- Pinwriter Serial Interface (optional) £55
- P2200 Cut Sheet Feeder £59
- Additional Font Cartridge £25

NEC PINWRITER P6/P7 Plus

- NEC P6+ 80 columns £439
- NEC P7+ 136 columns £575
- Colour Option £74
- Serial Interface £73
- Cut Sheet Feeder £125
- NEC Ribbons for P6 £8; P7 £9.50

Hewlett-Packard Printers

- HP Quiet Jet Plus £437
- HP Desk Jet Plus £549
- HP Paint Jet Colour £699
- HP LaserJet Series IIP £855
- HP LaserJet Series II £1265
- HP LaserJet II TONER £85
- HP Scan Jet £1499
- 1Meg Ram Add-on Laser Jet II £349
- 1Meg Ram Add-on Laser Jet IIP £275

12 months
FREE
maintenance
on site

Star Printers

- LC10 Printer £136
- LC10 Colour £195
- LC15 £275
- LC24-10 Printer £215
- LC24-15 £339
- NB24-10 Printer £399
- XB24-10 Colour £399
- XB24 Colour Kit £35
- LC10 Ribbon Colour £5
- XB24-15 Colour £515
- Cut Sheet Feeder £55

EPSON PRINTERS

- EX800 £429
- EX1000 £564
- FX850 £315
- FX1050 £405
- FX1060 £679
- GQ5000 Laser £999
- LQ400 £198
- LQ850 £459
- LQ550 £269
- LQ860 Colour £510
- LQ1050 £575
- LQ1060 £649
- LQ2550+ £925
- LX400 £132
- LX850 £195
- SQ850 £490
- SQ2550 £895

CUT SHEET FEEDERS for

- EX800/FX800/850/LQ800/850 £130
- FX1000/LQ1000/1050 £175
- LQ2550 £390
- LX400/800/850/LQ400/500/550 £69

TRACTOR FEED for

- LQ800 £44; LQ850/FX850 £69; LQ1050/FX1050 £85; LQ2500 £90; LQ2550 £90.

ACCESSORIES

- EX800/1000 Colour Option £55
- EX800/1000 Colour Ribbon £14
- LQ2500 Colour Option £65
- Multifont Card for LQ550/850/1050 £95

(Securicor Carriage on Printers £7)

EPSON PRINTER INTERFACES

- All these interfaces fit inside the printer
- RS232 £32
- IEEE 488 £40
- RS232 + 2K Buffer £52
- RS232 + 8K Buffer £79

PRINTER LEADS

- BBC Centronics 4' long £5
- BBC Centronics 6' extra long £7
- Compact's Special Centronics Lead £7
- Archimedes Printer Lead 6' £6
- Nimbus Centronics Lead £6
- IBM Parallel Lead 6' £6
- Double Ended 36 way Centronics Lead 4' £7
- Double Ended 36 way Centronics Lead 6' £9
- MSX Centronics Parallel Lead 4' £12
- RS232 Leads (Various) P.O.A.

Listing Paper (Perforated)

● 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
● 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
● 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£19
● 1,000 Sheets 15" x 11" Fanfold Paper	£9
● 1,000 Sheets true A4 Fanfold Paper 70gms	£11
● 2,000 Sheets true A4 Fanfold Paper 70gms	£19
● Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

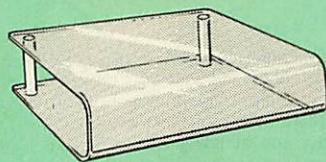
Carriage 1K Sheets £2.50, 2K Sheets £3.00

PRINTER LABELS

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£5.00
1,000 90 x 36mm (Twin Row)	£4.90
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.25
Carriage on 1,000 Labels £1.00	

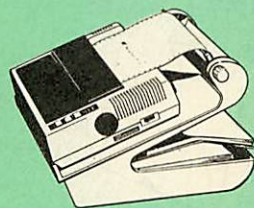
Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	£16 (carr £3)
136 Column version	£20 (carr £4)

Professional Printer Stand



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments i.e. one above the other, the desk space required for your printer functions is effectively halved. Additional

facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

80 Column version £28 (carr. £3)

132 Column version £30 (carr. £4)

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	£3.00	—
BBC Micro	—	£3.50
BBC Master	—	£4.00
Archimedes Micro pair	—	£9.00
Citizen 120D	£3.95	£4.50
RX/FX80/MX80	£3.00	—
DMP2000	£3.75	£4.75
EX/LQ800	£4.50	£4.50
EX/LQ1000	£6.75	£5.00
RX/FX80/85/800/MX80	£3.25	—
RX/FX100/1000	£5.00	—
Kaga/Taxan KP810/815	£4.90	£5.00
LQ500/550/800/850	£4.50	£6.00
LQ1050/LQ2500	£7.00	—
LX80/86/800/850	£3.25	£4.50
M1009/GLP	£3.80	£3.75
NEC P2200	£6.00	£5.00
Panasonic KX1080/81	£3.50	£4.75
Panasonic KX-1124	£8.00	£5.00
SQ2500	£23.00	£5.50
Star LC10/NL10	£4.25	£5.00
Star LC24-10	£5.00	£6.00
Olivetti Ink Jet	—	—
Cartridges (set of 4)		£9

Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Universal Printer Sharers/Changer

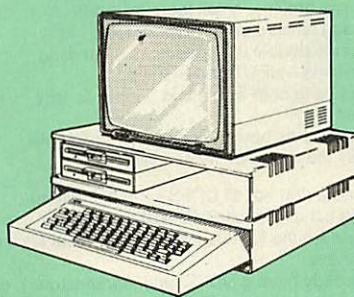
Connect upto 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments)

Connects	Serial	Centronics	P&P
2 to 1	£20	£22	£3
3 to 1	£27	£30	£3
5 to 1	£36	£39	£4

(Cables extra at £6 each. Please specify type required when ordering)

PLINTHS FOR BBC MICRO, MASTER & PRINTERS

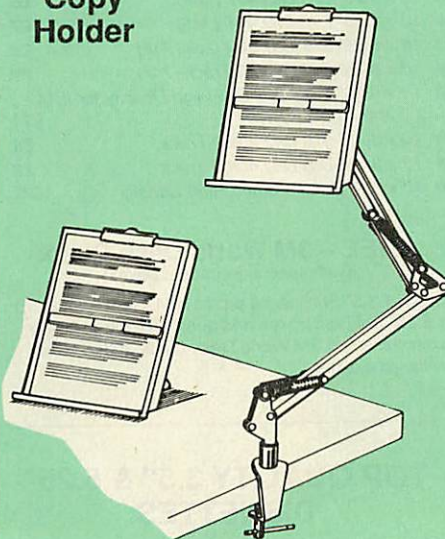


Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationary. The computer slides neatly in the lower section allowing easy access to remove the lid.

The single printer stand is equally sturdy but instead of cooling slots it has elegant cutouts on the sides. This allows easy access to paper from all sides. Colour: BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	£13
Double BBC Plinth	420 x 310 x 210mm	£24
Printer Plinth	420 x 310 x 105mm	£12
Single Master Plinth	490 x 310 x 105mm	£14
Double Master Plinth	490 x 310 x 210mm	£26
(Carr. Single plinth £2; double plinth £3)		

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top £7 (carr. £3)

Angle poise £12 (carr. £3)

Handy Printer Switch

A handy two way compact printer switch that enables you to connect 2 Micros to 1 printer, or 2 printers to 1 Micro. Attaches easily to your printer, monitor, etc. A low cost solution for educational establishments. Ideal for those wishing to use a dot matrix and a laser printer. Available in two configurations.

Compact AB Switch Centronics £19

Compact AB Switch RS232 £18

(Cables extra at £6 each)

MEGABUFFER 256



The Smallest 256K Printer Buffer Unit in the world 38mm x 130mm x 134mm.

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. The features are:

- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatibility with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in text unit for both the buffer & your printer.

Only £119 (carr £5)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms, see the feature in our advert.

THE EPSON RX-FX-KAGA Printer Commands Revealed

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you are with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON RX-FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

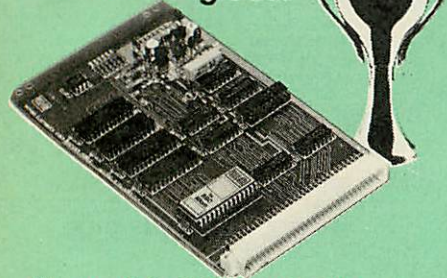
£5.95 (No VAT)



CREDIT CARD 24 HOUR
Ansaphone Hot Lines
 (0923) 50234 or 33383

Continued → → → → → → → →

Archimedes Real-Time Digitiser



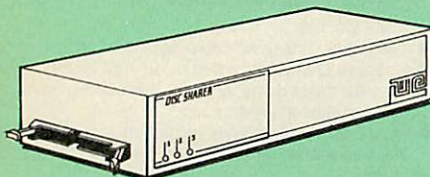
Now supplied with **NEW RISC OS Version Software**

Watford's Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £249

A Set of Colour Filters for colour image grabbing using a video camera **£16**
New Risc-OS Software Upgrade **£39**

DISC DRIVE SHARER



(Ideal for educational establishments)

At last, a low cost alternative to the Econet system. Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Launch Price : **£65** Price includes 3 Cables

DISC PLONKER RACK



When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk.

Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

Acorn & Watford DFSs

- Watford sophisticated DFS ROM **£16.00**
- Watford DFS Kit complete **£69.00**
- We will exchange your existing ROM for Watford's ultimate DFS ROM at only **£12.00**
- DFS Manual (comprehensive) **£6.95**
- Acorn DNFS ROM **£17.00**
- Acorn ADFS ROM only **£25.00**
- Acorn 1772 DFS ROM Kit **£49.00**

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£39.00**.

- SPECIAL PRICE **£44.00**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£30.00**

Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.

3M – DISKETTES

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor

- 10 x 5.25" S/S D/D 40T (744) **£5**
- 10 x 5.25" D/S D/D 40T (745) **£7**
- 10 x 5.25" S/S D/D 80 Track (746) **£8**
- 10 x 5.25" D/S D/D 80 Track (747) **£9**
- 10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT **£14**
- 10 x 3.25" S/S D/D 40/80 Track **£9**
- 10 x 3.25" D/S D/D 40/80 Track **£9**
- 10 x 3.5" Double Sided High Density **£22**

FREE – 3M World Desk Clock

(with special promoted boxes)

Buy 5 x 3.5" 3M special promoted Disc boxes, or 10 x 5.25" 3M Disc boxes and qualify for the specially commissioned 3M World Desk Clock. (Offer valid while stocks last).

TOP QUALITY 3.5" & 5.25" DISKETTES

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

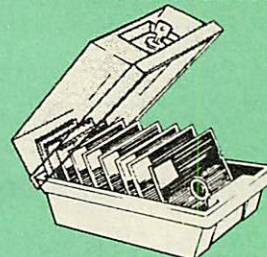
- 10 x M3 3.5" D/S D/D 80 Track **£9**
- 10 x M9 3.5" D/S High Density **£22**
- 10 x M4 5.25" S/S D/D 40 Track **£5**
- 10 x M5 5.25" D/S D/D 40 Track **£7**
- 10 x M7 5.25" D/S D/D 80 Track **£9**
- 10 x M8 5.25" D/S H/D Hi-Density **£13**
- M2 3" Double Sided **£3 each**

FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

ANTISTATIC LOCKABLE DISC STORAGE UNITS

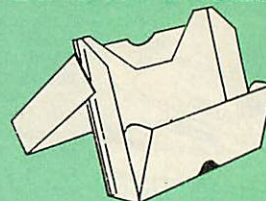


Gives double protection – Strong plastic case that affords real protection to your discs. Antistatic helps avoid data corruption whilst in storage. The smoked top locks down. Dividers and adhesive title strips are supplied for efficient filing of discs.

- M35 – holds up to 50 5.25" discs **£4.95**
- M85 – holds up to 95 5.25" discs **£6.95**
- M25* – holds up to 25 3.5" discs **£4.95**
- M50 – holds 50 3.5" discs **£6.50**
- M10 – holds 8 of No. 10 Data Cartridges **£15**

* Not lockable

PLASTIC LIBRARY CASES



Holds up to 10 5.25" Discs. **Only £2.00**

DUST COVERS (For our Disc Drives)

- Single CLS (without PSU) **£3.20**
- Single CS (with PSU) **£3.25**
- Twin CLD (without PSU) **£3.85**
- Twin CD (with PSU) **£3.90**

DISC ALBUMS

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

£4

Special BULK OFFER on 5.25" DISCS

(Supplied packed in Anti-Static Lockable Storage Units) (Lifetime warranty on Discs)

**PRICES
SLASHED**

BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
● Without Sleeves	£30	£35	£40
● With Sleeves	£33	£38	£43

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below. This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with an Utilities Disc.

The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our 80 track drives are already fitted with a 40-80 select switch.

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.

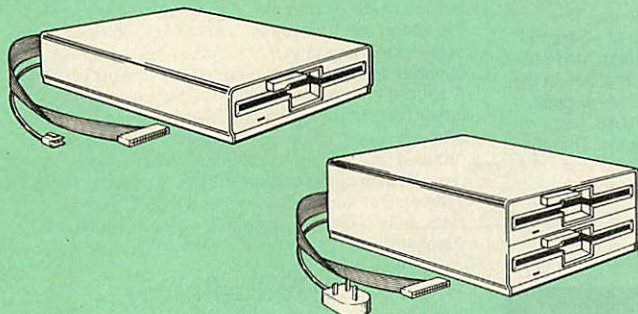
Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public. If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.** We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below are for single drives in standard single cases. Single drives in a dual case cost an extra £18. (At Watford we anticipate your needs of tomorrow, not just today!)

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 4th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.

Our Disc Drives conform to BS415



"Test Bureau Approved for Use in Education"

Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
400K (720K)	CLS400S £75	CLD400 £168	CS 400S £85	CD400 £188
800K (1,44M)		CLD 800S £153		CD 800S £163

● TWIN Disc Drive Case, complete with Power Supply & Cables £43
Securicor carriage on Disc Drives £6 to £7

Prefix C = Cased Drive
L = Less PSU
S = Single
D = Double

Suffix S = 40-80 Switchable

e.g. CLS400S = Cased Disc Drive, Less power supply unit, single 5.25" 400K, (720K in double density); Double sided; 40/80 track switchable.

Cable to connect 5.25" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3.5" and 5.25" Disc
Drives simultaneously to the BBC Compact £13

Special 40/80 Disc Drive/DDFS Mk II Offer



● The popular 40/80 track 400K single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.

● Watford's extremely popular DDFS Disc Interface (allows 720K storage). Will run in both Single & Double Density modes.

● A comprehensive User Friendly Manual.

A Bargain at Only £119 (£7 carr) (Offer valid while stocks last)



3.5" DISC DRIVE OFFER

These top quality 3.5" Double sided, 80 track, 1 Megabyte (unformatted each Disc Drives), are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Drives to connect to BBC Micros own PSU

● CLS35 400K Unit £65 ● CLD35 Twin 800K £119

Drives with built-in Power Supply Unit

● CS35 Single 400K £85 ● CD35 Twin 800K £129

(P.S. CS35 Single is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage).



WATFORD'S WINCHESTER DRIVES

Undoubtedly the best value for money Winchester Hard disc available anywhere for the BBC Micro.

This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with a Utilities Disc.

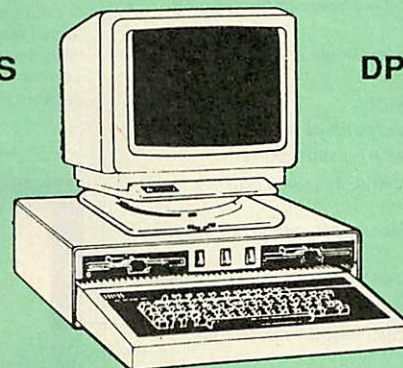
Finished in rugged metal and fetching BBC beige, the Winchester has an internal fan, so quiet you won't even hear it! A switched mode power supply and a neon-lit on/off switch are there along with a light on the hard disc to tell you when it is working – just compare the price with our competitors' 20 or 28 Mbyte discs!

Compatible with the Master, and the BBC B (with 17 X disc interface).

● 30 Megabyte BBC Hard Disc £395 (carr £7)

CDPM 800S

DP35-800S



Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

CDPM 800S for the BBC B & Master £175

A Double disc drive with a difference! Times are changing fast for the floppy disk, and whilst the current standard for the BBC B and Master series is the 5.25" disk, the standard of the future will most certainly be the smaller, faster and more reliable 3.5 inch disks – now a standard feature of both the Master Compact and the Archimedes Series.

To support the present disc drive users, and cope with the future, we have designed our own plinth-mounted disk system – called the DP35 800S. It contains both the 5.25 inch and the 3.5 inch drive formats as well as offer a firm and rigid support for a monitor on top. With the BBC Micro underneath, the plinth makes a surprisingly small footprint on the desk – leaving you more space to work with.

The 5.25" disc drive is 40/80 track switchable. DP35-800S has its own power supply, independent of the BBC Micro.

DP35-800S for BBC/Master £165

(Securicor Carr. £7)

(The above drive units are 2 Megabytes unformatted)

Continued → → → → → → → → →

QUEST MOUSE Mk II



- Quest Mouse II & Quest Paint £58
- Quest Mouse II, Quest Paint, AMX Stop Press & Pagefont £89
- Quest Mouse II only £29
- Quest Paint Software only £34
- Quest Font Disc (22 Text Fonts) £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
- Part Exchange your unreliable AMX Mouse for a Quest Mouse for only £22 (P.S. Quest Paint is not compatible with BBC Compact)



**Winner of the
BBC Acorn User
1990 Award for
the Best Art/
Graphics software**

ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them. Some of the features are:

- Pick filenames off the screen for loading and saving.
- Rotate a cutout to any angle and Distort it to any four sided shape.
- Has Built in Font editor.
- Default brushes and patterns on startup.
- 16 x 16 font available on start up.
- Ability to reset patterns, fonts and brushes to default at any time.
- ROM based enhanced Epson and compatible printer dump.
- ROM based enhanced extended picture routine.
- Ability to create and abort extended pictures.
- Improved disk access speed for extended pictures.
- User definable sideways RAM driver for incompatible sideways RAM systems.
- Ellipses at any angle on Master 128 (or B with GXR ROM).

ConQuest ROM Package £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

NEW

ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro £39

RB2 Marconi TRACKER BALL

RB2 (AMX/Quest compatible) £45
RB2 including Quest Paint £75
RB2-A for Archimedes £52

THE NEW Mk III AMX MOUSE

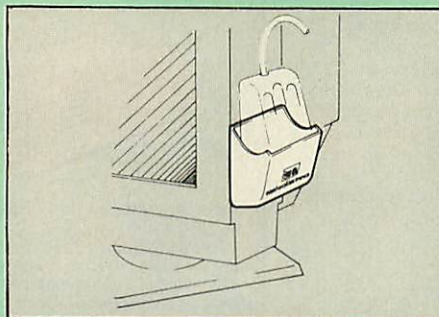
Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

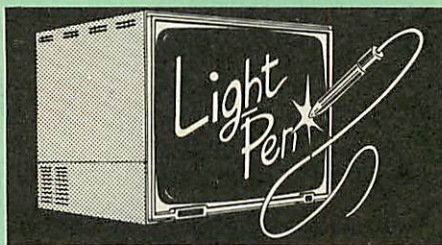
- MOUSE MAT £3
- AMX MOUSE ONLY £29
- AMX SUPERART Package £34
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £32
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £13
- AMX DESIGN (ROM) £55
- AMX XAM Educational £15
- AMX EXTRA EXTRA £16
- AMX MAX A gem of desktop (ROM) £20

WE MOUSE HOUSE



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk. It protects it from damage when not in use, yet within easy reach when you need it again. There is also a second compartment for your pens and pencils – and at £4 it doesn't cost a rodent's ransom.

Price £4



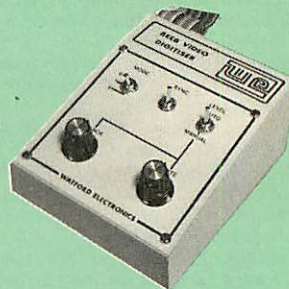
Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

FLEET STREET EDITOR

- Software pack for BBC Micro £33
- Software pack for the Master £39
- Admin Xtra Disc Utility £13
- Walt Disney Disc Utility £13
- Fonts N Graphics Disc Utility £13

BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.

Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional ★ commands. The package is designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROMs to work on it. A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image. Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £5)

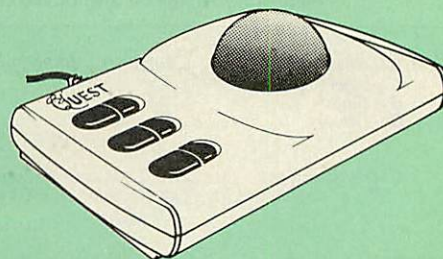
(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

NEW

QUEST – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version £32
QT-20 Archimedes Version £35



**Winner of the
BBC Acorn User
1990 Award for
the Best DTP/
Word Processor**

The WAPPING EDITOR

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a Turbo DFS which gives DFS access times comparable with those of ADFS.

PAGE LAYOUT SECTION

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module is a mode 0 version of the highly acclaimed Quest Paint package, and incorporates all the same drawing facilities, e.g. pencil, brush, airbrush, polygon, circle, ellipse, fill, cut-and-paste, etc., etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

WORD-PROCESSOR

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

cont./-

THE FONT EDITOR

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Upgrading to the Wapping Editor could not be easier since the font editor will convert fonts from other packages, such as Quest Paint or Stop Press (formerly Pagemaker), into Wapping Editor format and a mode conversion utility will convert any screen in modes 1, 2, 4 or 5 into a full grey-scale mode 0 screen. Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser, either independently or from within the Wapping Editor package.

Wapping Editor Software Pack £69
Wapping Editor plus Mouse £89

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages laid out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

The Beeb HandScan Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware

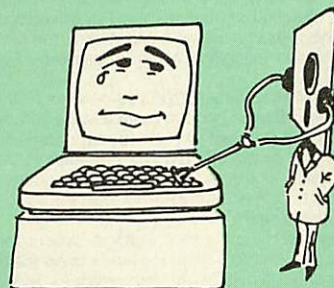
£135

Wapping Font Disc

Sixteen Wapping Editor fonts including smaller versions of Oberon and Daisy and two new sizes of the standard font. Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines. Supplied complete with instructions.

£12

DIAGNOSTICS DISC



The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.

The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:

RAMs, ROMs, ULAs, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and Z80 2nd Processors.

This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

(Only suitable for BBC B with 8271 DFS)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms see the feature in our advert.

NEW

Beeb DOS 2.2

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual. (Will only work on 360K Disk Drives)

Price: £39

(Please write in for technical literature)

Continued → → → → → → → → →



ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved *FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on your BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

● Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: £59 (carr. £3)

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price:	Aries B-12	£36
	Aries B-12C	£5

ARIES B-488 IEEE-488 INTERFACE UNIT

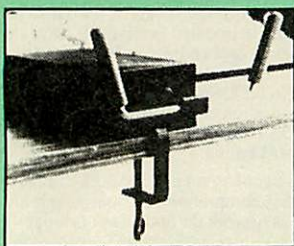
The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

VOLTMACE JOYSTICKS

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24

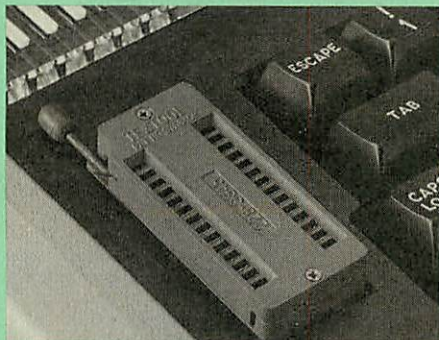
Delta Base B



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

£25

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

● Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.

● The low profile of the socket allows unrestricted access to the Keyboard.

● All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.

● This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)

● BBC, B+ and Master compatible.

ONLY £18 (carr £3)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

● Complete System	£11
● Spare Cartridges	£2.75
● Spare Rack	£1.65

ROM Cartridges for the BBC Master

Will accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin £9; Quad £14

16K Disc Ram Module

(16K Sideways RAM Module)

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.

Key points to note about this new addition to the Watford range of products are:

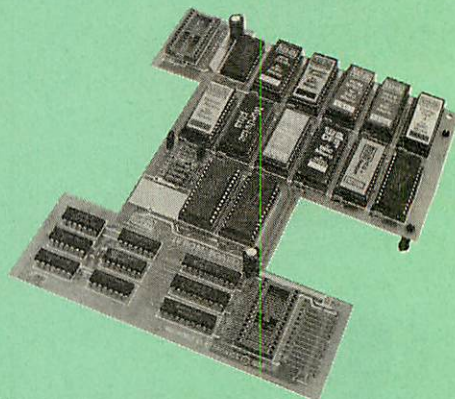
- Write protection (useful in a variety of circumstances)
- Compact construction
- No overheating or overloading problems.
- Free utilities disc supplied
- Can be used as a 16K PRINTER BUFFER.
- Ideal for professional software development.
- Supplied with utilities software disc.

Only: £29 (carr £2)

Optional Battery back-up fitted

£3

SOLDERLESS SIDeways ROM SOCKET BOARD



The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:

- Increase your BBCs capacity for ROMs from 4 to 16.
- No soldering required.
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35

Battery Backup fitted £39

Battery Backup only £3

16K Sideways RAM £8.50

(carriage £3)

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

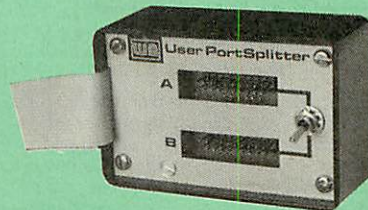
FINANCE AVAILABLE

In these days of expensive borrowing, we are pleased to have negotiated a special low rate finance deal for our customers, with flat interest rate of 12.25% per annum, typical APR 25.5%.

In addition to the above, we are able to offer all Archimedes and BBC Master computers as well as selected hardware on a 0% interest free finance deal.

For further details please telephone: 0923 37774 ext 223/203/201.

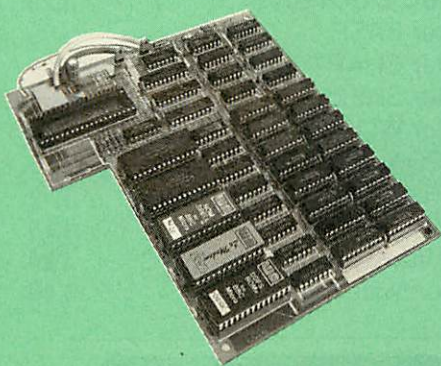
USER PORT SPLITTER UNIT



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at £22 (carr £2)

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 7 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD & 7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

INTRODUCTORY PRICES:

- ROM/RAM card with 32k dynamic RAM£48
- ROM/RAM card with 64k dynamic RAM£65
- ROM/RAM card with a massive 128k dynamic RAM£109
(carriage on ROM-RAM Card £3)

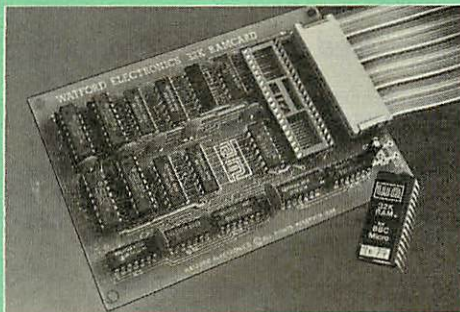
OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit£9
- 16k Dynamic RAM for Upgrade£13
- Battery backup£3
- Read and Write protect switches£2 each
- Complete ROM-RAM board
All options installed£115

P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

32K SHADOW RAM- Printer Buffer Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

- IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer - type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free - 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.

- Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

- Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

Only £59 (carr £3)

(Price includes a comprehensive manual and the ROM)

Acorn Speech Synthesizer
package complete, for the
BBC B Microcomputer

Special Offer £18

Watford Electronics are:

- Acorn Qualified Dealer & Econet Referral Centre
- ARIES PC Dealer/Distributor
- Cambridge Computer Dealer
- Epson Silver Centre
- EIZO Monitor Dealer
- Microvitec Appointed Dealer
- NEC Appointed Dealer
- Panasonic Premier Dealer
- Roland Plotter Official Dealer
- Star Printer Sub Distributor
- Taxan Monitor Distributor
- 3M Media Premier Distributor

BBC SOFTWARE'S Popular Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs£11.25
- Maths with a Story 2 (Disc). 4 further level maths programs£11.25
- Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs.£17.00
- BONDING: Science (Disc) O-Level Chemistry program.£20.00
- ELECTROMAGNETIC SPECTRUM (8 Discs) O-Level program.£20.00
- ELECTRONICS IN ACTION (Disc) O-Level program.£19.95
- NEWTON & THE SPACE SHUTTLE (Disc) O-Level program.£20.00
- ECOLOGY (Disc) O-Level program.£20.00
- POLYMERS (Disc) O-Level program.£20.00
- Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule.£20.00
- FOOD & POPULATION (Disc) O-Level program.£20.00
- MICROTECHNOLOGY (Cassette) O-Level program.£11.25
- DEUTSCH DIREKT! (Disc & Audio Cassette)£19.95
- Modem Master (Disc)£11.25
- ADVANCED TELETXT SYSTEM£8.65
- PERIOD TABLE SOFTWARE£20.00
- Astronomy - Primary (Disc)£12.00
- Computers at Work - Primary£17.35
- Introducing Geography 11-17 years£17.50
- Electric Fields 6-14 years£11.25
- Black Queen Contract Bridge£13.00
- Espana Viva - 3 Discs£19.95

Educational Software

FUN SCHOOL 2 - Red:

Under 6 yrs - 8 programs on Discs, Shape Snap, Find the Mole, Teddy Count, Write a letter, Colour Train, Pick a Letter, Spell a Word & Teddy Bears Picnic.
£13.00

FUN SCHOOL 2 - Green:

6-8 yrs - Eight programs on Disc, Number Train, Shopping, Maths Maze, Treasure Hunt, Bounce, Packing Caterpillar, 3 Number jump
£13.25

FUN SCHOOL 2 - Blue:

Over 8 yrs - Eight programs on Disc, Build a Bridge, Passage of Guardians, Unicorn, Logic Doors, Souvenirs, Code Boxes, Mystery Machine & Escape.
£13.50

Versatile BEEB SPEECH SYNTHESIZER Unit



The Watford Speech Synthesizer is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £3)

Continued → → → → → → → → →

VIEW 3.0 ROM	£45
VIEW PROFESSIONAL	£50
VIEWSHEET (Acornsoft)	£36
VIEWSTORE	£36
VIEWSPELL with 80 track disc	£25
VIEWPLOT Disc (Please specify for Master 128 or Compact)	£20
VIEW-INDEX	£12
OVERVIEW packs 1 & 2	£65
HI-VIEW	£38

Watford's own Sophisticated VIEW PRINTER DRIVERS

Epson FX80 & Kaga KP (Disc)	£8
Juki & Brother HR15 (Disc)	£8

OFFICE MASTER



CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

FINAL ACCOUNTS – Will take data prepared by the Cashbook module and produce a complete set of accounts as following: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques.

EASILEDGER – A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS – Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL – Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only **£21 (Disc)**

OFFICE MATE



- DATABASE
- BEEBCALC SPREADSHEET
- BEEBLOT GRAPHICS

DATABASE – Set up a computerised card index system with powerful search facilities.

SPREADSHEET – Offers many calculation and editing features

BEEBLOT – Provides visual representation from Spreadsheet data.

OFFICE MATE Only £10 (Disc)

MINI OFFICE II

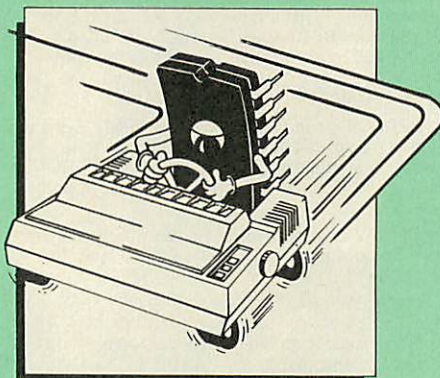
DISC Version for BBC B & B+	£14.00
DISC Version for BBC Master	£16.00
DISC Version for the Compact	£18.00

(When ordering please specify for which Micro & 40 or 80 track Disc)

Advanced Computer Products

Advanced Disc Toolkit	£28
Advanced Disc Investigator	£24
Advanced 1770 DFS BBC	£27
Advanced 1770 DFS Master	£28
Advanced File Manager	£24
Advanced Control Panel	£28

VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing at only a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redefinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute * command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

COMPUTER CONCEPT'S ROMS

COMMUNICATOR	£49
DISC DOCTOR	£28
Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
MEGA-3 ROM	£76
SPELL MASTER	£42
TERMI	£25
Wordwise	£24
Wordwise Plus	£40

Wordwise plus £40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every **WORDWISE PLUS** package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of **WORDWISE PLUS**.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only £24

(N.B. Word Aid requires a Disc interface in your Micro)

BOOK

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£5.95
15 Hr Wordprocessing BBC/WW & WW+	£5.95
30 Hour BASIC (BBC Micro)	£12.95
Advanced User Guide for BBC	£10.95
Amiga Machine Lang. Guide	£19.95
Archimedes 1st Step – Beginners Guide	£9.95
Archimedes Assembly Language	£14.95
Archimedes BBC Basic Guide	£20
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers Reference Manual	£79.00
Arm Assembly Lang. Prog. Manual	£15
Assembly Language Prog. for the BBC	£10.95
Assembly Language Quick Ref.	£21.95
BASIC 2 – User Guide	£2
Basic V – A Dabhand Guide	£9.95
BBC Basic Guide (Archimedes)	£19.95
BBC Computer Handbook – The Complete	£14.95
BBC – Mastering Assembly Code	£8.95
BBC Micro & the small Business	£5.75
BBC Micro – Within the	£13.95
BCPL User Guide	£14
C Big Red Book of	£7.50
C – A Dabhand Guide to	£14.95
C Programming Lang. 2nd Edition	£24.95
COMAL – Introduction to	£9.50
Deutsch Direkt! (Book only)	£5.95
DISC FILING SYSTEM (DFS)	
Operating Manual for BBC	£6.95
File Handling on BBC Micro	£8.50
FORTH on the BBC Micro	£9.95
Hackers Handbook – New	£9.95
Introduction to COMAL	£9.50
Inside Information, Computers & Coms.	£9.95
ISO-PASCAL Reference Manual	£9.95
Mysteries of DISC DRIVES and DFS REVEALED	£5.95
Mastering Assembly Code	£8.95
Mastering Interpreters & Compilers	£14.95
Mastering Music	£6.95
Mastering the Disc Drive	£7.95
Master 512 Guide – Dabs Press	£9.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14
Master Reference Manual Part 2	£14
Master Reference Manual – Advanced	£17
Mathematical Programs in BBC BASIC	£9.95
MINI OFFICE II – A Dabhand Guide	£9.95
PASCAL on the BBC Micro	£9.95
PASCAL Programming	£9.95
Practical Disc File Techniques	£5.95
The Epson FX-KAGA PRINTER	
Commands REVEALED	£5.95
The Software Business	£5.50
Understanding Interword –	
A Beginners Guide	£6.50
View 3.0 User Guide	£10
View Guide (View 2.1)	£5.00
Viewsheets & Viewstore Dabhand Guide	£12.95
VIEW Dabhand Guide	£12.95
Viewsheets User Guide	£10
Viewstore User Guide	£10
Wordwise + A User Guide	£10.95
Z88 – A Dabhand Guide	£14.95
Z88 Computing	£9.95
Z88 Magic	£14.95
Z88 Using Your	£9.95

Carriage on Books vary between £1 to £3.50, depending on their weight.

BOOKS for IBM PC & Compatibles

1-2-3 For Business 2nd Edition	£20.95
1-2-3 Command Language	£19.95
1-2-3 Mastering Release 3	£22.95
1-2-3 Mastering – 2nd Ed.	£20.95
1-2-3 Special Edition (QUE) – Using	£22.95
1-2-3 Using – Rel. 3	£22.95
8086/8088 Assembly Language Prog.	£13.50
8086/8088 Programming the Ability – Using	£17.95
Accountancy software in Business – Using	£12.95
Agenda – Using	£21.95
Aldus PageMaker – Using	£21.45
Amstrad Basic 2 Manuals	£9.95
Amstrad Technical Manual for 1640	£19.95
Amstrad PC Programmers Ref Guide	£7.50
Amstrad PC1512-1640 Step by Step – Using	£9.95
Amstrad PC 1512 PC User Guide – 2nd Ed	£9.95
Autocad – Mastering Through Rel. 10	£28.95
Autocad – Using Release 10	£26.95
Business companion on the 1640	£12.95
C Programming Library – The	£24.95
dBase III – Mastering	£21.95
dBase III Plus – Complete Reference	£19.95
dBase III Plus – Mastering	£21.95
dBase III Plus Handbook 2nd Edition	£20.95
dBase III Plus – tips, tricks and traps (QUE)	£20.45
dBase III Plus – Quick Ref. Guide	£4.95
dBase III Plus – Quick Prog. Guide	£8.95
dBase Instant Reference (III & III+)	£10.95
dBase IV – Handbook	£21.95
dBase IV – Understanding	£22.95
dBase IV – Using	£20.95
DBASE IV – Complete Ref	£27.95
Desk Top Publishing by Design	£18.95
DOS & BIOS Function – Quick Ref Guide	£6.95
DOS Instant Reference (up to 3.3)	£10.95
DOS, Mastering for Versions up to 3.3	£22.95
DOS Power Tools (includes a disk)	£39.95
DOS Plus Manual/Amstrad PC	£9.95
DOS – Programmers Ref. Manual 2nd Ed	£22.95
Excel IBM Version – Using the	£22.95
FAX – Managing with	£12.95
Framework III – Mastering	£22.95
Good Software Guide – for IBM PCs	£19.95
Hard Disc Instant Reference	£10.95
Hard Disc Manage IBM PC XT AT	£19.95
Hard Disc – Managing your 2nd Ed.	£20.95
Hard Disc management – Quick Reference Guide to	£4.95
IBM PS/2 Handbook	£19.95
Laserjet Handbook – The	£19.10
Local Area Networks 2nd Generation	£19.95
Lotus 1-2-3 Desktop Companion Soft/B	£24.95
Lotus 1-2-3 – Illustrated	£18.45
Microsoft 'C' Systems Prog. In	£23.95
Microsoft GW BASIC	£12.95
Microsoft Word 5 – Using	£20.45
MS-DOS – ABC's of 2nd Ed.	£17.95
MS-DOS Advanced Programming 2nd Ed.	£22.95
MS-DOS Bible 3rd Edition	£19.95
MS-DOS Handbook 3rd Edition	£18.95
MS-DOS Masters – Tricks of	£22.50
MS-DOS Quick Prog Ref Guide	£8.95
MS-DOS Commands – Quick Reference Guide	£4.95
MS-DOS – Running 4th edition	£19.95
MS-DOS – Supercharging 2nd Edition	£17.95
MS-DOS Users Guide 3rd Edition	£27.95
MS-DOS – Using	£19.95
Network User Guide	£21.45
Networking Personal Computers 3rd Ed.	£20.95
Norton Programming Guide to IBM	£–
Norton Utilities – Inside the	£19.10
Norton Utilities Ver 4.0	£15.40
Novell Network – The ABC of	£21.95
Operating the IBM PC Network	£18.45
PageMaker IBM PC – Mastering	£21.95
PageMaker on IBM PC – Using	£22.95
Pagemaker – Using Aldus	£19.95
Paradox – Mastering	£22.95
PC-DOS Using 3rd Ed	£21.95
Programming Guide to EGA & VGA Cards	£23.95
Prog. Guide to IBM – P. Norton's	£19.95
Quattro – Mastering	£21.95

Smart – Using	£21.45
Smart, tips, tricks and traps (QUE)	£22.45
SuperCalc 4 – Mastering	£19.95
Supercalc 4 – Using	£23.75
Supercalc 5 – Using	£20.95
Supercalc Professional	£17.95
Symphony 4th Edition – Mastering	£24.95
Turbo C Bible	£21.95
Turbo Pascal 5 – Using	£22.95
Turbo Pascal 5.5	£24.95
Turbo Pascal – Advance Techniques in	£20.45
Turbo Pascal – Complete Reference Ver 5	£24.95
Turbo Pascal Complete Ver. 4.0	£21.45
Turbo Pascal Disc Tutor	£36.25
Turbo Pascal Program Library	£22.95
UNIX – The Complete Reference	£26.95
Upgrading & Repairing PC's	£25.95
Ventura Mastering – 2nd Ed.	£22.95
Ventura Publisher – Using	£22.95
Ventura Publishing – Instant incl. DISC	£34.75
Wordperfect 5 – Desk Top Companion	£22.95
Wordperfect Desktop Companion	£22.95
Wordperfect – Illustrated	£18.45
Wordperfect Made Easy	£15.95
Wordperfect – Quick Reference V5	£7.95
Wordperfect 3rd Ed – Using	£20.45
WordStar 4.0 – Mastering	£20.45
WordStar Release 5.0 – Using	£19.95
WordStar – Quick program Ref. Guide	£8.95
Xerox Ventura Publishing – Inside	£27.95

THE COMPLETE BBC COMPUTER USER HANDBOOK

"Why has no-one written a book like this before? It's long overdue"

If you own a BBC-B, BBC B+, Electron, Master 128, Master Compact or Archimedes then this book is for you. It shows you how to get the most from your computer, and how to make the computer work for you. Although some sections are machine specific, most of the information, programs, hints and good solid experience are for the whole range of BBC machines. The general style and level means that both beginner and expert will feel satisfied with the quality and quantity of the material.

GENERAL – Uses and abuses of computers.

HARDWARE – How to design your own work station. Hardware additions (disc drives, ROMs, printers, 2nd processors, etc). DIY alterations.

HARDWARE RUNNING BBC-BASIC – All BBC machines are described with their differences. Compatibility between the various BBC machines. Networks. The Archimedes and its advantages.

GETTING ORGANISED – So that you keep track of your programs and control of your software. Setting up for easier programming sessions.

NEAT PROGRAMMING – Good style. Writing structured programs. Getting the best from BBC-BASIC, Graphics and screen displays. Speeding up programs. Saving space.

GENERAL PROGRAMMING TIPS AND HINTS – with a multitude of examples (eg input vetting, dealing with dates, blanking out function key messages, error trapping, disabling ESCAPE and BREAK, use of EOR with colour, etc).

DEBUGGING – Specific errors and how to handle them. How to test programs fully.

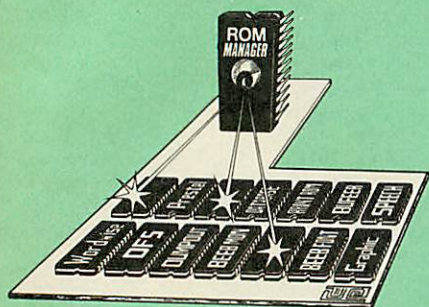
STANDARD PROGRAMS – Assessing word-processors, spread-sheets, databases, graphics packages, communications etc. How to customise them to your own requirements.

COMPUTERS AT HOME AND IN THE OFFICE – Introducing the computer to the office. Program protection. Computers and the law. Communications. Selling your own programs. 28 FULL CHAPTERS, elegantly written and extensively indexed. To dip into, consult, or read from cover to cover, again ... and again ... and again ...

Only: **£14.95** (Book No VAT)

Continued → → → → → → → → →

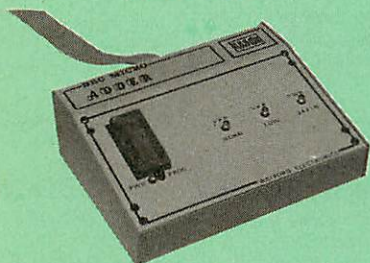
ROM MANAGER



Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs. Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.
"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

ADDER



The only low cost EPROM Programmer for the BBC Micro that will program both the standard 21V and the new 12V5, 27128 EPROMs.

The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled. The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.

Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: 2516, 2716, 2532, 2732, 2764, 27128, & 27256.

£65 (£5 Carr)

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast. We use these erasers for all our own erasing work.

- **ERASER EB** - Standard version erases up to 16 chips. **£28 (carr £3)**
- **ERASER GT** - Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£30 (carr £3)**
- Spare UV tubes. **£12**

Servisol Foam Cleaner

This 415ML, king size multi-purpose foam cleaner spray is ideal for cleaning the Keyboard, Monitor, Disc Drive and your computer furniture surfaces. Simply spray on the surface to clean and wipe off with a clean cloth.

£2.50

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/ Monitor Screens.

£2.50

Aerosol Dust Spray

This simple to use aerosol spray is ideal for removing Dust and Dirt deposits from the Keyboards and similar inaccessible places.

£3

SPARES for BBC Micro

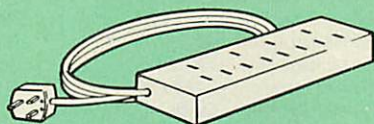
BBC Keyboard	£46	Speaker	£3
Master Keyboard	£62	Keyswitch	£1.50
UHF Modulator	£4	16MHz Crystal	£2
Speaker Grill	£1	17.734 MHz Xtal	£2
BBC Power Supply	£59	32.768MHz Xtal	£1
BBC B Refurbished		Master PSU	£59
Casing	£25	Master Casing	£39
Replacement Flexible 17 way Keyboard Connector			£4

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage transient spikes/surges caused by lightning or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

£9.50 (carr £1.50)

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£13.50 (carr £1.50)

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

£2

Metal Chip Extractor **£3**

28pin DIL HEADER PLUG

SOLDER type **£1.50** IDC CRIMP type **£1.95**

8 WAY DIP SWITCH

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only £1.00

28 pin ZIF SOCKET (Textool) **£6.95**

CONNECTING LEADS

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

DISC DRIVE POWER LEADS

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00**; Dual **£3.75**

DISC DRIVE INTERFACE LEADS

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	-
6 way Power Connector	120p	150p

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

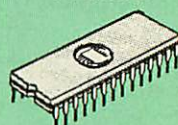
Watford POWER DUCK

£8

CHIP SHOP

1 Meg DIL D-RAM	£8.75
1 Meg ZIP D-RAM	£9.95
DS3691	£4.50
DS88LS120	£5.25
LM324	£0.45
SN76489	£5.50
SAA5050	£8.75
UPD7002	£6.00
2764-250nS	£2.80
27128A-250nS (12V5)	£3.00
27128-250nS (21V)	£4.50
27256-2	£3.50
27512-2	£4.95
27C101G (1 Meg)	£10.00
4013	60p
4020	£0.90
4164-15	£2.50
4464-12	£8.50
4464-15	£8.00
4816 RAM	£2.00
41256-15	£4.50
41256-12	£5.00
6264LP-8K	£4.25
6502A CPU	£5.00
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£3.40
6522A	£4.50
62256ALS-15	£10.00
62256P-12	£8.50
6818	£4.00
6845SP	£6.00
68B50	£2.95
68B54	£7.50
7438	40p
74LS00	25p
74LS04	25p
74LS10	25p
74LS123	80p
74LS163	70p
74LS244	80p
74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	70p
75159	£3.00
9637	£2.00
ICL7673PA	£2.00

ASSORTED ROMS



ACORN ADFS	£25
ACORN BASIC 2 plus User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
Acorn Graphics	£25
Acornsoft C Disc	£36
Acorn LISP	£19
Acorn OS B+	£25
Acorn OS 1.2	£14
Basic Editor	£24
BBC PCB Designer	£49
Beebmon	£22
Buffer & Backup Communicator	£20
Dump Out 3	£25
EPSON NLQ ROM	£25
Graphics Extension Rom	£25
GXR-B	£21
GXR-B+	£22
ICON Master	£28
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Micro Prolog	£25
Microtext Disc	£46
Microtext Rom	£199
NLO DESIGNER	£25
Numerator - Archi	£69
Numerator - BBC	£39
Pendown ROM	£32
ROMIT	£29
SERIAL ULA	£13
TED	£35
Terminator B, B+	£28
Terminator Master	£32
Video ULA	£14
ULTRACALC II	£26
1Mb OS ROM	£39

Spring Hands-On Open Day

Sponsored by: The Micro User and Acorn Computers

EDUCATION

Of particular interest to Educational user will be a separate area reserved for discussing the needs and requirements of Schools, Colleges, LEAs' and Teachers alike. If your Educational Establishment is interested, come and talk to us about our SPECIAL Prices, Service and Support.

To be held at:
JESSA HOUSE
On Sunday
29th April 1990
10.00am to 4.00pm

SALES ADVICE

Watford Electronics Technical and Sales personnel will be on-hand to discuss all your technical queries and computer requirements. Come and see live demos of popular BBC/Archimedes Software and Hardware.

Also appearing:

ACORN – technical staff to answer your questions and advise on the whole Acorn range of computers.

THE MICRO USER – Contributors and editorial team will be at hand to answer all your questions.

MIKE COOK and GORDON TAYLOR – The BBC B/Master and Archimedes Gurus will be available to discuss your technical queries.

COLTON SOFTWARE – to present the world beating *Pipedream 3* package.

COMPUTER CONCEPTS – to demonstrate the sophisticated *Impression* DTP package.

HYBRID TECHNOLOGY – To demonstrate their famous *Music 5000 Synthesizer*.

MINERVA SOFTWARE – to show the power of the *System Delta Plus* and the *Atelier Art* packages.

CLARES – to demonstrate *Render Bender* and the popular *Inter Dictor* flight simulator.

SILICON VISION – to exhibit their *3D Solid modeller* and advance CAD packages.

PANASONIC – to demonstrate their full range of dot matrix and laser printers.

**** FREE REFRESHMENTS WILL BE SERVED ****

INSTANT CREDIT – Mercantile Credit will be at hand to arrange both 0% and Extended Credit on the day.

**ON PRESENTATION
OF THIS VOUCHER
ON THE OPEN DAY,**



**WE SHALL ALLOW
£10 OFF ANY PURCHASE
OVER £200 (ONE PER PERSON)**

Prices subject to change without notice and available on request. ALL OFFERS subject to availability.

Mail Order and RETAIL SHOP. Trade and Export inquiries welcome. Government and Educational Establishments' OFFICIAL ORDERS Accepted.

Shop Hours: 9.00am to 6.00pm. Monday to Saturday. Thursdays 9am to 8pm. (Free Customer's Car Park)

VAT: UK customers please add 15% VAT to cost incl. Carriage.

CARRIAGE: Unless stated otherwise, minimum £1.50 on all orders. £3 on Larger items. On bulkier items, £7 Securicor charge applies (UK mainland only) Overseas orders, carriage is charged at cost

Specifications of all products are given in good faith but is subject to change without notice. Some items vary in their availability. Please ring for latest delivery situation.

Watford Electronics

**JESSA HOUSE, 250 Lower High Street,
WATFORD WD1 2AN, ENGLAND**
Telephone: (0923) 37774; Telex: 8956095;
FAX: 0923 33642

COMPUTERS, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

ACORN MASTER SERIES

		r.r.p. Ex. VAT	Offer Ex. VAT
AMB15	Master 128	£439.00	£395.00
MASTER 128 DISC DRIVES AND UPGRADES			
ADC06	Master Turbo upgrade	£120.00	£110.00
ADF14	Erom cartridge	£11.95	£11.00
ANB21	DNFS ROM	£17.91	£17.00
ANB22	Econet upgrade kit	£42.95	£40.00
ANB23	Disk upgrade kit	£84.34	£75.00
ANB29	ADFS ROM	£26.08	£25.00
ANC21	Universal 2nd Processor	£75.00	£60.00
ANB28	1770 DFS upgrade	£49.00	£46.00
CSX200	Cumana 40 track double sided 200k	£94.78	£84.00
CSX400S	Cumana 80 track double sided 400k	£112.00	£97.00
CDX400	Cumana 2 x 80 track double sided 400k	£181.74	£149.00
CDX800S	Cumana 2 x 80 track double sided 800k	£216.52	£180.00
	*switchable to 40 track		
CS200		£112.17	£97.00
CS400S	Specified as above but	£129.57	£105.00
CD400S	with power supply	£213.04	£180.00
CD800S		£242.61	£200.00

MONITORS

1431/MS	Microvitec 14" standard res. colour metal	£216.52	£195.00
1431/DS	Microvitec 14" standard res. colour plastic	£216.52	£195.00
1431/AP/MS	As 1531/MS with added PAL	£242.61	£220.00
1451/MS	Microvitec 14" medium res. colour metal	£260.00	£235.00
1451/DS	Microvitec 14" medium res. colour plastic	£260.00	£235.00
1451/AP/MS	As 1451/MS but with PAL	£300.00	£270.00
1441/MS	Microvitec 14" high res. colour (0.31mm dot pitch)	£440.00	£400.00
1441/DS	Microvitec 14" high res. plastic	£440.00	£400.00
1455/DA2	Microvitec Archimedes monitor	£270.00	£250.00
T.TECH 501	Microvitec 14" touch sensitive screen	£260.00	£235.00
2030/CS2	Microvitec 20" colour monitor	£389.69	£355.00

ACORN ARCHIMEDES

A310 SERIES

AKB15	Archimedes A310 Base only	£899.00	£755.00
AKB15/AFK11	Archimedes A310 Colour System	£1119.00	£945.00
AKB15/1455DA2	Archimedes A310 + Microvitec 1455	£1169.00	£1050.00

A310M SERIES

AKB30	Archimedes A310M (with PC Emulator)	£959.00	£810.00
AKB30/AFK11	Archimedes A310M Colour System	£1179.00	£1000.00

ACORN ARCHIMEDES UPGRADES

AKA62*	RISC-OS operating system	£29.00	£27.00
AKD50	Floppy disk drive	£115.00	£105.00
AKD52	20Mb hard disk drive and expansion card for 300 series	£499.00	£449.00
AKA01	Backplane	£39.00	£37.00
AKA05	ROM expansion card	£59.00	£56.00
AKA15	Midi add-on to I/O	£39.00	£37.00
AKA16	Midi Podule	£69.00	£64.00
AKA10	I/O expansion card	£85.00	£77.00
AKA42	PC emulator	£99.00	£90.00
AKA51	0.5Mb RAM for Arch. 305	£149.00	£139.00

UPGRADES FOR A3000 SERIES

AKA53	1Mb RAM	£199.00	£185.00
AKA12	User Port/Midi	£49.00	£46.00
AKA18	Serial Upgrade	£19.00	£18.00

ACORN A3000

A3000	£649.00	£585.00
-------	---------	---------

ACORN ARCHIMEDES 400/1 SERIES

A410/1	Archimedes 410/1 Base only	£1199.00	£1025.00
A420/2	Archimedes 420/1 Base only	£1699.00	£1400.00
A440/1	Archimedes 440/1	£2499.00	£2120.00

UPGRADES FOR A400/1 SERIES

AKA52	1Mb RAM Upgrades	£199.00	£175.00
AKA51	2nd Floppy Upgrades	£125.00	£110.00

LASERS AND PRINTERS

We supply the whole range of printers from most popular manufacturers including:

AMSTRAD	BROTHER	CANON	CITIZEN
EPSON	HP	JUKI	NEC
OLIVETTI	PANASONIC	QMS	QUME
SEIKOSHA	SIEMENS	STAR	

ALL AT HIGH DISCOUNT
- PHONE FOR LATEST OFFER PRICE

Full DTP systems supplied including
S/W, scanners etc.

All prices exclude VAT and are available for a limited period and are subject to availability
Phone for best price and products not listed

We supply a full range of computers from: AMSTRAD, EPSON, OLIVETTI, PHILIPS, SHARP, AST, ZENITH, SCHNEIDER . . . Phone for prices.

WILLOW SOFTWARE

Dept AU 1/90

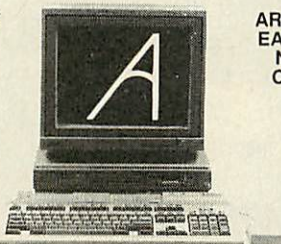
Mail Orders Office • Callers by appointment

Tel: (0934) 876031

Willow Software
The Willows
Wrington Lane
Congresbury
Bristol
BS19 5BQ

CANNON COMPUTING

THE ONLY CHOICE FOR FAST PERSONAL SERVICE



ARCHIMEDES:
EASY TO USE
NO LIMIT TO
CAPABILITY.

Acorn COMPUTER'S
PREMIER DEALER - ONE OF
THE TOP 25 UK DEALERS.

The ONE computer for all walks of life and all ages:
Business (including, IBM), Educational, Graphics,
Health, Music, Art, CAD, DTP, WP and Games.

Archimedes features: 32bit RISC Architecture for high speed, enhanced RISC-OS window environment, low cost, multitasking, MS-DOS and UNIX compatibility.

Cannon Computing is one of Acorn's top dealers. All your required computer products and queries can be solved by us as your stockist and Econet Network approved supplier and installer.

Unlike most dealers Cannon Computing are available 24 hours, 7 days per week to offer instant assistance to any of our customers - during evenings and weekends when most dealers are closed you can rely on us. We have also found that these are the most convenient times for many people to have demonstrations, we spend time discussing individual needs. We can also personally deliver any equipment purchased and set it up on your premises - evening and weekend service available if required.

For urgent orders we offer **SAME DAY DELIVERY** - most orders delivered within 24 hours - subject to stock availability.

We stock the complete range of Acorn machines: BBC Masters, Archimedes 310, 410/1, 420/1 and 440/1s and the new BBC micro, the A3000 and we can part exchange. Monitors, disc drives, printers, upgrades and accessories are always in stock together with consumables and all types of software.

Phone now for brochures and prices - QUANTITY AND EDUCATIONAL DISCOUNTS available.
FOR THE BEST BEFORE SALES GUIDANCE AND AFTER SALES CARE CONTACT:

CANNON COMPUTING

35 RUSLEIGH GREEN, THORLEY PARK,
BISHOP'S STORTFORD, HERTS, CM23 4JH

TEL: 0279-507727 or 0831-407652

FINANCE ON ARCHIMEDES - CANNON COMPUTING ARE LICENSED CREDIT BROKERS

Acorn Better solutions.

contex

Archimedes is a trademark of Acorn Computers Ltd.

BANK MANAGER for disc systems only

The most advanced and versatile personal bank account management program available for all BBC computers. Consistently acclaimed!

"data entry is a delight . . . professional . . . excellent product" - *Micro User April '86*
Enter cheques and receipts. Standing orders any frequency. Automatic date sequencing. Reconcile statements. Search, amend and delete. Unreconcile. Move forwards or backwards. Analyse expenditure. Forward cash flow forecast. Up to 36 simultaneous 'bank accounts' online, inter-account transfers. 9999 standing orders. 99 analysis categories. 12 actual and 12 budgets per category, over 4,000 postings on an 80tk disc. Reports to screen or printer. Graphics. Foreign currency support. Password. File recovery. Auto exec file. Field editing. Itemised look ahead. Programmable report writer.

Standard Bank Manager for the BBC B, B+ £17.50

BANK MANAGER MASTER for disc systems only

Includes all of the facilities of the Standard Bank Manager plus ADFS file system support, shadow screens, uses sideways RAM, 40 or 80 column screen reports, improved graphics, m/c windows, function key support and onscreen labels, additional functions added to the already extensive report facilities.

Bank Manager Master for the MASTER and MASTER COMPACT £22.50

ARCHIMEDES BANK MANAGER

All facilities of Master version plus high speed 'native' mode, wild card analysis enquiry, analysis code sort and other enhancements.

"Impressed, ideal, easy to use" - *Micro User, March '88*

ARCHIMEDES AND A3000 BANK MANAGER £25.00

BANK MANAGER BUSINESS UTILITIES for disc systems only

For the 'professional' who also uses the BANK MANAGER to control the business accounts the BUSINESS UTILITIES add double entry trial balance and programmable spreadsheet analysis reports. Generated from cheque and cash transactions keyed into BANK MANAGER. Just pass the reports to your accountant! Available for all Bank Manager versions, state which.

Bank Manager Business Utility Pack 1 £12.00

TYPING TUTOR

Quickly learn to touch type. Over 90 smoothly graded lessons graduate you from the basic home keys to complete keyboard mastery. Unique word scan line checking. Target WPM and percentage correct. You may revise the targets or lessons as required. Audio key click for positive key depression. Establish a typing rhythm using the automatic metronome. Free format option. Disc version includes several enhancements eg. on screen keyboard, exact mode, on screen parameters. Recommended.

Cassette £12.50, Disc for BBC B, B+, MASTER and COMPACT £12.50
FOR ARCHIMEDES AND A3000 £15.00

ALL PRICES FULLY INCLUSIVE FREE POSTAGE WITHIN UK.
Enquiries and Credit Card orders telephone 0234 838347

Please state: cassette, 3 1/2" disc, 5 1/4" 40tk disc, or 5 1/4" 80tk disc and computer type (B, Compact, Master or Archimedes).

CONTEX COMPUTING
(REF. AU)

15 WOODLANDS CLOSE, COPLE, BEDFORD MK44 3UE

Clare's Micro Supplies welcome you to their world of computer software for the Archimedes, where your imagination is the *only* limitation.



PRO-ARTISAN

Pro-Artisan enhances all the advantages of the Archimedes, providing an immensely powerful graphics package that is so easy to operate. Allowing *Pro-Artisan* to successfully integrate into every environment. From schools, colleges and universities to the world of television and Graphic studios.

£99.95

SAVE £70 NEW PRICE

RENDER

BENDER

Render Bender is a powerful 3D animation package that allows the construction of scenes using 3D objects with advanced ray tracing algorithms. After which it is easy to compile ray traced

screens into super smooth and visually stunning animated sequences.

£79.95



Armadeus Sound Sampler, "the biggest break for ears in years" can take any stored sound and create unbelievable effects and sound tracks for use in your own programs, videos, etc. Add on the 8 bit A to D, *Armadeus* Sound Sampler Board at £149.95 and you can plug in your own tape/record player, even C.D. The output quality could put you on Top of the Pops.

£79.95



INTER DICTOR

This is not just a game but a realistic flight simulator. You are in control of a high performance jet whose handling characteristics have been programmed by professionals from the aerospace industry. Everything is simulated so there are no canned scenarios, the action depends on how you play. But watch out... it's almost too real.

£34.95

Knowledge Organisation. It sounds so easy doesn't it, but it's surprising how difficult it is. Now, however, thanks to Clare's new program *Knowledge Organiser*, it can all be very simple—Lawyers, Writers, Researchers, Lecturers, Students, Z88 users. Everyone who needs to organise, collect, collate and create will benefit from this revolutionary new program.

£59.95

The all new *Artisan 2* is now fully RISC OS compatible and makes full use of Windows, Icons and the Mouse in Mode 12. *Artisan 2* uses the full power of the Archimedes and the new Help Window makes this program a joy to use. *Artisan 2* has been hailed as the best of its kind and comes highly recommended. Remember the possibilities are endless.

£59.95



CLARE'S
MICRO SUPPLIES

98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA.
Telephone: 0606 48511 Fax No: 0606 48512

Designed for your imagination



£15 BBC DEMON

Regular contributor Phil Bender of Romford has written a 'demon' cyclic space program for the BBC micro, to rival the one published for the Archimedes in February's Risc Revue.

Cellular automata have been very much in vogue recently. This particular variety, the invention of David Griffeath of the University of Wisconsin, has a very simple rule, yet still displays complex behaviour.

The rule is that a cell in state k at time t must 'eat' any of its orthogonal neighbours in state $k-1$ at time $t+1$. This is shown by those cells taking on colour k . Cells in the maximum state can be eaten by those in state 0, so wrapping round, and giving rise to the description 'cyclic space'.

The initial random state is referred to as the 'debris' phase. Within this diamond shape patches of colour develop, eating and being eaten in turn – the 'droplet' phase. Eventually, spiral bands of colour are seen expanding outwards. This is known as the 'defect' phase.

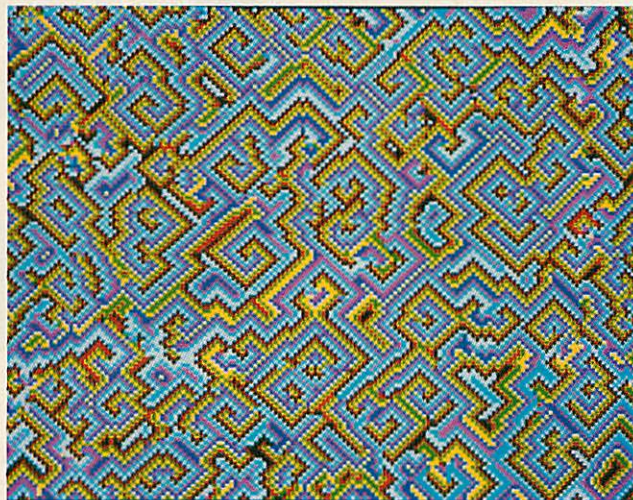
A defect is a closed loop of cells, each of which differs from its neighbours by 0, 1 or -1, the cumulative sum of which is not equal to 0.

This has the property of being self-sustaining, forcing surrounding cells to change state in a regular manner.

Some of these defects are more efficient than others and take over the whole screen. These are the 'demons' of the last phase – hard to distinguish from the defect phase.

For a more detailed explanation see the article, Computer Recreations by A K Dewdney in *Scientific American*, August 1989. The speed at which these phases succeed each other depends on the maximum value. As this increases so the probability of certain configurations arising decreases. Values less than about seven are hardly worth the bother. Values above

EIGHT BITS



seven are fine but 15 takes a long time. Still, it could be used as a conversation piece!

Just type in the program in the yellow pages, save and run it. The program starts up in mode 2 and asks you for the startup value (see above). The iterations then begin using fast machine code screen-poking graphics. To pause at any point, press P. Press O to restart. You will have to hold P down until the end of an iteration to make the program pause.

Note that because of the screen writing techniques, the program will not run in a shadow screen mode or with a second processor.

£20 VIEWSHEET GRAPH PLOTTER

Eight Bits regular Andrew Pillidge from Woking has sent an excellent article on *Viewsheets* graph plotting and the linking file feature. The accompanying program is listed in the yellow pages.

Viewsheets is ideal for calculating the value of Grandad's mattress if he knows how much he puts in it each month, and we are going to show you a program that turns the spreadsheet into a graph. Getting numbers out of a *Viewsheets* file directly is difficult but fortunately there is

an easier indirect method using something called a linking file.

A linking file, as described in the manual, is a disc file written to or read from whenever your spreadsheet is recalculated, allowing subtotals and the like to be passed from sheet to sheet, for example when your spreadsheet is too big for memory.

However, the linking file is sufficiently simple in format to enable you to use a straightforward Basic program to access the data.

Viewsheets creates all linking files with the name VS_n , where n can be any number from 1 to 255. These files are always stored in directory V, which means ADFS users must first create a directory by typing:

***CDIR V**

from the command mode. The file, which is initially blank, is created by:

CREATE n x y

where n is the number in the VS_n filename, and x and y are the dimensions of the linking file. As you will now realise, the linking file can store a two dimensional block of values to pass on to another sheet.

Once it's set up, writing a value into the linking file is simply a matter of putting:

WRITE(n, x, y, value)

into a suitable slot. This accesses the disc file VS_n and stores 'value' in the location in the linking file with co-ordinates x, y . To read a value from a linking file, use:

READ(n, x, y)

which reads a value from VS_n from linking file co-ordinates x, y .

The format of a *Viewsheets* linking file is not actually classified information – it is explained in great detail in the manual, and *BBC Acorn User* has published several programs that read values from linking files, the most recent of which was Bruce Smith's step by step guide to *Interchart* in June 1988.

Each value is given six bytes starting from byte number 6, and the linking file values are stored in order of their x co-ordinate,

row after row. Bytes 0 to 2 of the file contain nothing important. Byte 3 is the maximum y co-ordinate, byte 4 is the maximum x co-ordinate and byte 5 is &AA which is not important. The values are just like floating point variables in BBC Basic.

Armed with this information, you can easily write a Basic program to read values out of a *Viewsheet* linking file and turn them into a graph. In the case of Grandad's pension, you could plot his accumulated wealth over 12 months of the year if you set up 12 slots in the spreadsheet to send the month's accumulated total cash to the linking file.

This file could be 12 slots across and one deep and if you called it *VVS89* it would be created by typing `CREATE 89 12 1` from command mode in *Viewsheet*.

If, for example, slots C7 to N7 contain the values you want to plot, then you must set up 12 extra slots in the sheet, for example C10 to N10, to write the values to the disc file. In this example C10 would contain `WRITE(89,1,1,C7)`, D10 would be `WRITE(89,2,1,D7)` and so on.

Now for three hints. If you put

`WRITE(89,COL-2,ROW-9,C7)`

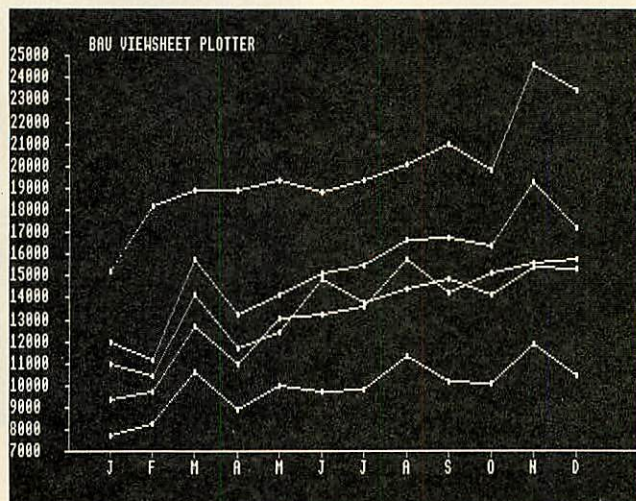
into slot C10 instead of the above, you can replicate it very quickly. The functions of `COL` and `ROW` in a *Viewsheet* spreadsheet return the column and row numbers of the slot in which they occur. This allows you to access the linking file in the same relative position as the slot being written.

The second hint is to specify the linking file being accessed in a separate slot. Suppose you put the value 89 into slot E9, and

`WRITE(E9,COL-2,ROW-9,C7)`

into slot C10 replicated along to N10, this means you can simply change the linking file accessed by changing one slot rather than editing 12 slots.

The third and final hint is based on the fifth corollary to Murphy's Law, which states



that no matter how you set up a spreadsheet, you will always want to change it just once more after the 'last ever' modification.

In case you decide to insert or delete some rows or columns and thereby shift the location of the slots that contain the `WRITE` commands, it is tremendously labour-saving to put just above the top left of this block of slots a slot that contains the calculated x co-ordinate of the top left slot of the block, and one that contains the y co-ordinate of the same slot. Why? – because then the whole block can be shifted.

When rows or columns are inserted or deleted above it, the x and y locator slots recalculate their own position and the `WRITE` commands continue to access the correct place in the linking file.

So, if the top left of the block of slots is slot C10, for example, then put `COL-1` into slot C9, and `ROW` into slot D9, and enter: `WRITE(E9,COL-C9,ROW-D9,C7)` into slot C10, and replicate it to D10N10, keeping references to E9, C9 and D9 with no change but altering C7 relative.

Back to the Basic program. Assuming you have now set up your spreadsheet, created and filled a linking file, you will now want to get the figures out and plot them. The program in the yellow pages works by opening the file, setting the file pointer

`PTR` to the correctly calculated position and reading values into a variable.

It starts by telling you the file size and maximum and minimum non-zero values. Then it turns it into several line graphs with one line for each row of numbers. The x-axis is labelled J-F-M-A-M-J-J-A-S-O-N-D but if you wished to alter the program to change this it could be done very easily.

The program ignores zero values so that it does not try to plot points for months of the year that have not yet been entered. This also allows the y-axis to start at a non-zero value.

The y-axis is scaled by taking the logarithm of the largest value and chopping off the decimal places to work out the scale interval. The x-axis is scaled to space out as many entries as there are.

So there it is: a spreadsheet to calculate Grandad's accumulated pension, compound interest included, and a block of slots to write values along a row into a linking file and a program to read them out and plot a wonderful graph.

The program is written to cope with many different sizes of linking file and it has proved very useful.

The procedures for getting the dimensions of the linking file and for getting values from it could be incorporated into your own programs, for example, to

write a program to turn spreadsheets into pie charts or histograms or some more complicated statistical evaluation.

Calculating a correlation coefficient or chi-squared value would be easier in Basic and a *Viewsheet* linking file is one possible way of getting at the raw data.

£10 MASTER 512 DISC PARTITION

It is a while since I have had a contribution from our Dutch followers – by far the most enthusiastic group of BBC users anywhere in Europe (including Britain!) so it is good to publish this contribution from Henk Oostrom from Zoetermeer as a follow up to Andrew Rawnsley's article in the January 1990 Eight Bits. Henk has asked for his contribution fee to be donated to charity, which we are pleased to do.

Henk finds the procedure described by Andrew Rawnsley to be a little cumbersome and presents an alternative solution in a program which does all the work. This program (in the yellow pages) makes a complete Dos partition of any size.

After creating the partition, you can start Dos Plus from the system disc and run the *HDisk* utility to install Dos Plus on the hard disc, using the 'Make hard disc bootable' option.



To prevent the disc head having to skip over the large `DRIVE_C` file when working without the co-processor, the partition is placed at the end of the free space.

When working under Dos Plus, the ADFS free space map and the directories are not used, all the filing operations take place within `DRIVE_C`. So, in

HINTS & TIPS

both instances, the hard disc is running optimally.

There is of course a snag to this solution. When you compact the disc, the `DRIVE_C` file is moved. This can be prevented by deleting the `DRIVE_C` file, performing the `*COMPACT` and then running the restore program, also provided in the yellow pages, and on the monthly disc. You will end up with a compacted hard disc and the `DRIVE_C` file restored.

The partition creation program works by asking for the number of megabytes required on the partition and then calculating the length of the `DRIVE_C` file. A dummy file is made to fill all extra space on the disc, and `DRIVE_C` is then created using `OSFILE`.

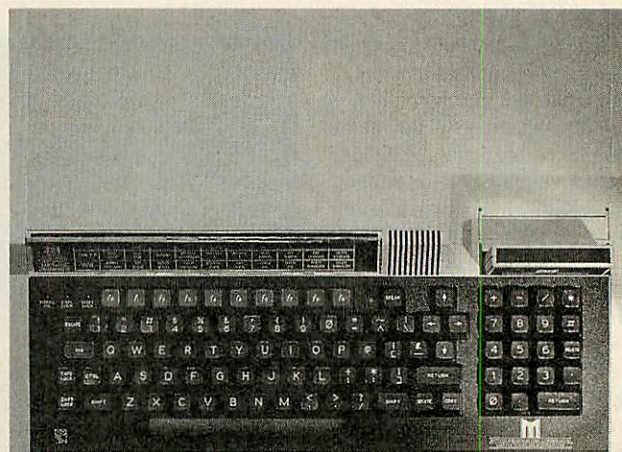
The dummy file is deleted

and `DRIVE_C` is filled with information for the header, the file allocation table (FAT) and the root directory.

The restore program just creates the same files again, using the size of the Dos Plus partition written on the hard disc by the creation program. Incidentally, this file `$.DOS.LEN_DRV_C` must not be deleted or the restore program will not work.

The restore program reads the `LEN_DRV_C` file and alters the ADFS directory and free space map. Since the file is in the same place as before, and no actual data has been written to the file, all the data is available as before.

To summarise, the creation program creates the partition to your specification and should immediately be followed by



running *HDisk*. The restore program is only needed if you want to compact the ADFS portion of the hard disc and you want to keep the `DRIVE_C` partition at the back end of the disc. If you aren't bothered, then just

ignore the second program. To run it, `*DELETE $.DOS.DRIVE_C` then `*COMPACT`.

Check this with `*MAP` and if there is more than one gap, `*COMPACT` again. Now run the restore program.

BEEBUG Ltd

Staff Vacancies...Staff Vacancies...Staff Vacancies...Staff Vacancies...Staff Vacancies

BEEBUG are leaders in the Acorn Marketplace with exciting ongoing developments of both hardware and software for the Archimedes computer range. We also publish the highly acclaimed BEEBUG and RISC User magazines. Expansion has created several vacancies for dedicated enthusiasts with experience of Acorn Computers and associated products.

SOFTWARE DEVELOPMENT ASSISTANT

As one of the leading software producers for the Archimedes we are looking for someone to join our team working on a number of interesting new software projects.

Reporting to the Software Manager, the successful applicant's duties will include providing technical support, program testing and evaluation, overseeing software production and eventually managing complete projects.

Although this is not a programmers position, a knowledge of Basic and Assembler would be useful, together with a familiarity of popular application software.

TECHNICAL SUPPORT ADVISOR

Our Technical Support team provides answers and advice on an extremely wide range of subjects, covering both software and hardware on the BBC Micro, Master and Archimedes computers.

We are looking for someone who owns a computer themselves and can demonstrate their enthusiasm on the subject. Training will be given, although a certain level of knowledge concerning existing products will be necessary along with the ability to express yourself clearly in writing and on the telephone. Experience on PC Compatibles, Commodore equipment and Econet would also be a benefit.

Salary-£6,000 to £12,000 depending upon age and experience

**Apply in writing (enclosing a c.v.) to:
The Personnel Manager, 117 Hatfield Road, St Albans, Herts. AL1 4JS**

Do not do anything else with the hard disc in between these steps, otherwise you will lose the partition data.

POINTS ARISING

John Buckley of Cheadle has written to say 'I would prefer it if contributors to your magazine would avoid writing phrases such as: of course it is perfectly straightforward to assemble the program to run at a different location in memory. I haven't a clue how to achieve this'.

Sorry, John, we do sometimes let these assumptions slip through.

A lot of the programs in Eight Bits are short assembler utilities, which often occupy less than 256 bytes on memory when converted to pure machine code.

The programs are always presented as source code (assembler) and near the start of the program will be a line setting the value of P%, for example: P%=&9000

Sometimes it is set to another variable's value but this will be assigned earlier in the program. The way to assemble the machine code to run elsewhere in memory is to change the value of P%, by altering that line of the source code and then running the program.

At the end of the routines we publish, there is always a line to save the assembled code to disc (maybe a straight *SAVE command or perhaps an OSCLI command containing the SAVE command). If the parameters are actual numbers like

*SAVE CODE 900 A00

then these too must be changed. If they are variables such as: OSCLI ("SAVE CODE"+STR\$~M%+" "+STR\$~(end%-M%)) then no alteration is necessary as the alteration of the variables at the start of the program will adjust the save instruction automatically.

You must alter the source code and create (save) a new machine code program.

It is pointless trying to alter the machine code file once it has been assembled.

Of course altering the program address is one thing, knowing what to alter it to is something else.

On a disc-based BBC micro, a routine which is less than 256 bytes long can equally well run at &900 or &A00, or &B00 if you don't use the function keys or

&C00 if you don't use definable characters. (Master owners can use these last two locations in any event).

A machine program may also run at any address higher than the value of PAGE (but lower than HIMEM).

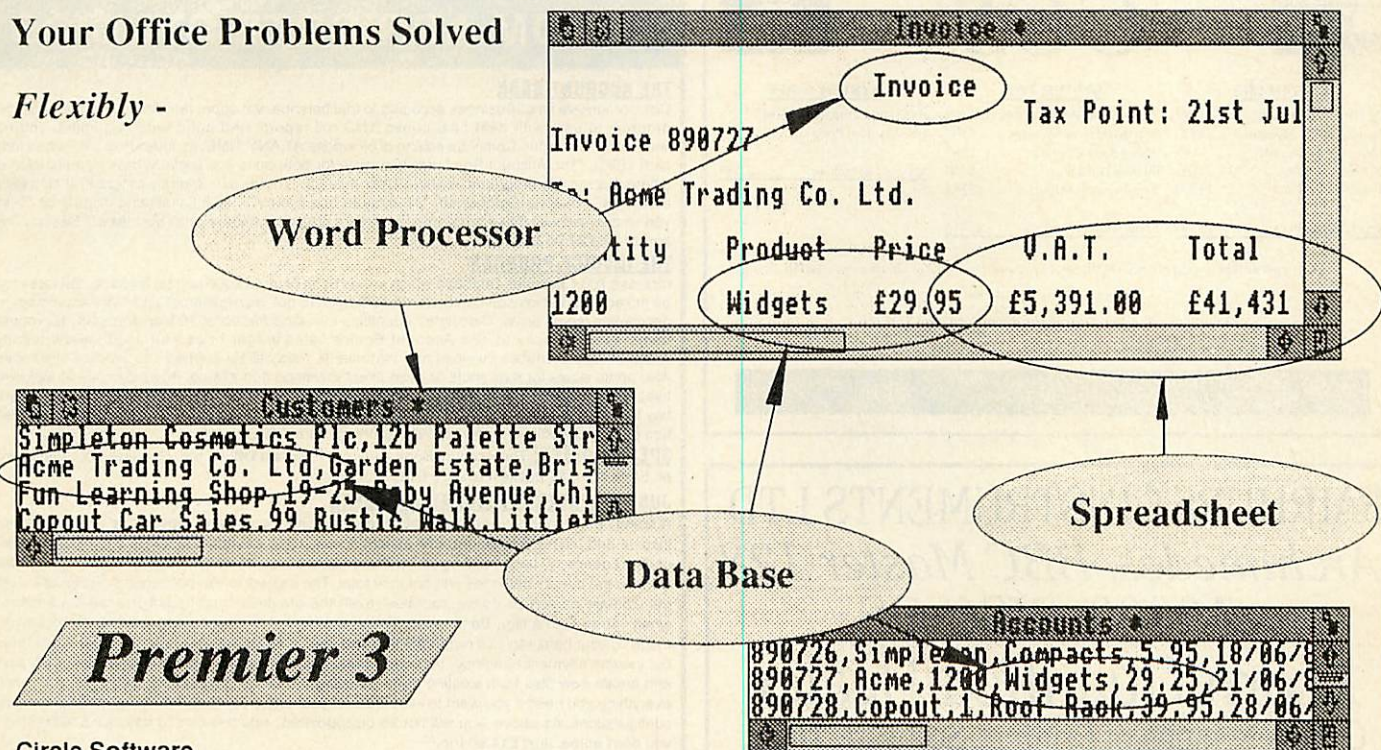
There isn't room here to describe all the possible memory areas which a program can use but all the technical manuals for the BBC and Master cover this in great detail.

If anyone else is confused by anything written in this column, do write and let me know, and I will try and explain it.

Send queries to the same address as for submissions, which is: David Atherton, Eight Bits, BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ.

Your Office Problems Solved

Flexibly -



Circle Software
33, Restrop View
Purton, Swindon
Wilts. SN5 9DG
Tel: 0793 770021

Premier combines Word Processing, Data Base, and Spreadsheet functions in one easy to use program

The News

Win £1,000,000 Bingo Prize

Maggie Resigns!

CHANCELLOR CUTS INTEREST RATES TO 4%

The Chancellor made sensational news and took the City by surprise when he announced a cut in interest rates to an incredible 4%.

...For up to-date
news call
0753 830466.

£5.49

PER BOX OF 13 DISKS*

.... Now here's some news you can believe!!

Buy two boxes of Branded Diskettes and we'll give you a third box FREE!

The sky's the limit. And if that's not enough each box contains extra disks - 13 or 27!! Fully tested and guaranteed for life it all adds up to a package too good to miss. *Price quoted is for 10 boxes of product no.1001 excluding postage, packing and VAT.

BRANDED DISKETTES: 2 FOR 1 REPLACEMENT GUARANTEE

PROD No	DESCRIPTION	PER BOX OF 13 DISKS		
		1-4	5-9	10+
1001	5 1/4" DS/DD 48TPI	5.99	5.79	5.49
1002	5 1/4" DS/QD 96TPI	6.99	6.49	5.99
1003	5 1/4" High Energy 1.2Mb	10.99	10.49	9.99
1004	3 1/2" DS 135TPI 720K	13.49	12.99	12.49

PER BOX OF 27 DISKS

1001-1	5 1/4" DS/DD 48TPI	11.99	11.49	10.99
1002-1	5 1/4" DS/QD 96TPI	12.99	12.49	11.99

DATA CARTRIDGES:

PROD No	DESCRIPTION	PER CARTRIDGE SUPPLIED IN PACK OF 3			
		1-3	4-6	7-10	11+
2001	DC300 XLP Equivalent	12.99	12.49	11.99	11.70
2002	DC600 A Equivalent	14.99	14.49	13.99	13.49
2003	DC2000 Equivalent	15.49	14.49	13.49	12.99

Note: 3M & DEI Branded Cartridges are also available. Please call.

STORAGE BOXES:

PROD No	DESCRIPTION	PRICE PER BOX		
		1-4	5-9	10+
5001	V10 5 1/4" diskette box holds 13 disks	1.99	1.49	0.99
5002	V10 3 1/2" diskette box holds 13 disks	1.99	1.49	0.99
5102	3 1/2" diskette box holds 40 disks with lock	5.99	5.49	4.99
5103	3 1/2" diskette box holds 80 disks with lock	7.99	7.49	6.99
5104	5 1/4" diskette box holds 50 disks with lock	5.99	5.49	4.99
5105	5 1/4" diskette box holds 100 disks with lock	7.99	7.49	6.99
5010	DC10 Data cartridge box with lock			
	holds 10 std data carts.	13.99	13.49	12.99
5011	MDC10 Data cartridge box with lock			
	holds 10 mini data carts.	9.99	9.49	8.99

WHITE BOX DISKETTES:

PROD No	DESCRIPTION	PRICE PER DISKETTE SUPPLIED IN PACKS OF 10			
		Up to 1000	1010-5000	5010-9000	9010+
1001-4	5 1/4" DS/DD 48TPI 360K 10's	25p	22p	20p	P.O.A.
1002-4	5 1/4" DS/QD 96TPI 720K 10's	28p	24p	22p	P.O.A.
1003-4	5 1/4" DS/HE 1.2Mb 10's	55p	50p	48p	P.O.A.
1004-4	3 1/2" DS/DD 135TPI 10's	56p	51p	49p	P.O.A.

NEW! 3 1/2" HIGH DENSITY 1.44 Mb BOX OF 10 £17.90!

BULK DISKETTES:

PROD No	DESCRIPTION	PRICE PER DISKETTE SUPPLIED IN PACK OF 1000			
		Up to 1000	2-5000	6-9000	10,000+
1001-2	5 1/4" DS/DD 48TPI 360K 1000	22p	20p	18p	P.O.A.
1002-2	5 1/4" DS/QD 96TPI 720K 1000	24p	22p	20p	P.O.A.
1003-2	5 1/4" DS/HE 1.2Mb 1000	49p	46p	43p	P.O.A.
1004-2	3 1/2" DS/DD 135TPI 720K 1000	49p	45p	39p	P.O.A.

LISTING PAPER: 1 PART LISTING PAPER

PART No	DESCRIPTION	PRICE PER	
		1000 shts.	Box
7001	11x9 1/2" Plain 60gsm. Box of 2000 sheets	5.75	11.50
7002	11x9 1/2" Plain 85gsm Microperf. Box of 1000 sheets	10.50	10.50
7003	11x9 1/2" Music ruled 60gsm. Box of 2000 sheets	5.75	11.50
7004	11x14 1/2" Plain 60gsm. Box of 2000 sheets	7.46	14.80
7005	11x14 1/2" Music ruled 60gsm. Box of 2000 sheets	7.46	14.80

All prices exclude carriage and VAT (Postage £3.00, Courier £6.50)

FOR AMSTRAD/EPSON RIBBONS REQUIREMENTS PHONE US NOW!

Ask about our DISKETTE CLEANING KITS too...

they're all at unbeatable Mydisk prices!

0753 830466/477 or fax 0753 830488

FOR INSTANT SERVICE

Mydisk Limited FREEPOST (RG1475), Windsor, Berks, SL4 1BS.

ALJ1/490



CCS



SYSTEM ONE

Acorn 4101 Archimedes	£1199
Acorn Colour Monitor	£220
1 Meg Ram Upgrade	£95
20 Meg Hard Disc	£195
Total System Cost	£1709

SYSTEM TWO

Acorn 4101 Archimedes	£1199
Eizo Multisync Monitor	£390
3 Meg Ram Upgrade	£265
40 Meg Hard Disc	£430
Total System Price	£2284

SYSTEM THREE

As System 2 but with ARM3	
Total System Price	£2879
Special Offer Price	£2589

Special Offer Price	£1540
Special Offer Price	£2050

Please phone for a special price on the specific equipment that you are interested in.

Offer Closes 31st May 1990

Phone Today For Full Details Northampton (0604 713732)

All Prices Are Exclusive of V.A.T.

Creddock Computer Systems

7 Lingfield Terrace, Junction Road, Northampton NN2 7HU

ACCOUNTING PROGRAMS FROM APRICOTE STUDIOS

THE ACCOUNT BOOK

Comprehensive small business accounts to trial balance. Vat approved. Absolutely the EASIEST program to use, with neat final books AND full reports and audit trails. Unlimited entries. Automatic date order. Complete editing of all entries AT ANY TIME. Includes new Vat Return form (Jan 1990). "The Account Book gets first prize for both price and performance" - comparison of different accounts programs in Micro User July 89. "A true user-friendly program. It succeeds admirably" - Beebug October 88. "An easy to use system" - A&B Computing August 89. "I am very impressed with these programs. These are programs for any small business." - Beebug December 89. £27.95 Inc.

THE INVOICE PROGRAM

Includes 700 Customer database which keeps track of up to 2500 unpaid invoices. Vat rates can be mixed (the vat section can be turned off if you're not vat registered) and there are almost no description length limits. Calculates quantities including fractions. 100 stock presets for regular items. Links directly to The Account Book's sales ledger or can be used independently. Automatically produces invoices and statements ready to be popped into window envelopes. Also prints labels for mail shots or even direct envelope addressing. Prints debtor lists including telephone numbers and instant database access to individual customers credit details. "If you buy these programs you will not be disappointed" - Beebug December 1989. Judging by the letters of thanks we have received, our customers agree. £27.95 Inc.

SPECIAL OFFER: The Account Book + Invoice Program £49.95 Inc. Requires dot-matrix printer. State 40 or 80 tracks if using a BBC B or Master.

JUST RELEASED: PERSONAL ACCOUNTS

A brand new program to keep track of all your personal income and expenditure. 48 user-defined income and payment headings with instant access to all the heading totals. 20 standing orders or direct debits. 10 bank/building society/credit card accounts with not only the opening balances but also the current balances and balance total. The easiest to use accounting system of all with the ultimate on screen editing facilities (even the previous cursor positions are remembered when you re-load a file). Bank reconciliation with look-a-like account statements to spot errors made by your bank etc. Full report printing and searching facilities including not only your entries but income/payment headings, bank accounts, standing orders and all their totals. Load, save and create new files from existing ones including the carrying forward of balances. Absolutely everything you need if you want to keep track of your finances. Runs on all disc drive and printer configurations. As above 'you will not be disappointed', return within 10 days for a full refund if you don't agree. Just £14.95 Inc.

All the above programs are available now by return of post for the BBC B, B+, Compact, Master, A3000 and Archimedes (inc. Risc OS). Please state computer when ordering. Thank you.



APRICOTE STUDIOS
2 Purls Bridge Farm
Manea, Cambs, PE15 0ND



Tel: 035 478 432 for information, help or to order

FAIRHURST INSTRUMENTS LTD
Archimedes, BBC Master 128
A3000, RISC-OS

Acorn Qualified Dealer
Complete range of Printers, Software, Discs,
Ribbons etc., IBM, Tandon, Amstrad and Apple

Dean Court, Woodford Road, Wilmslow, Cheshire SK9 2LT.

Tel: 0625-525694

COLOURJET 132

HIGH PERFORMANCE COLOUR INK JET PRINTER

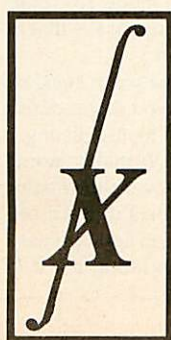
(compatible with IBM pc, BBC micro, Nimbus etc.)

- ★ PRINTS ALL 64 SCREEN COLOURS FROM CGA AND EGA USING OPTIONAL INTEGRIX SOFTWARE
- ★ EMULATES OTHER PRINTERS (IBM 3852, PJ1080A and QUADJET)
- ★ OVERHEAD TRANSPARENCY PRINTING
- ★ 80 + 132 COLUMN OPERATION, A4 WIDTH
- ★ UP TO 1280 DOTS/LINE ADDRESSABLE
- ★ FULL VIDEOTEX CAPABILITY
- ★ OPTIONAL BUFFERED RS232 (INTERNAL)
- ★ HIGHLY VERSATILE

**TEXTILE PRINTING
INK CARTRIDGES
NOW AVAILABLE**

ULTRA
LOW
NOISE

**LIST PRICE
£636 + VAT**



EDUCATIONAL DISCOUNTS AVAILABLE

CHURCH GRESLEY, BURTON ON TRENT
STAFFS DE11 9PT

Tel (0283) 215432 Fax (0283) 550325

Telex 341727 INTEGX



PUBLIC SECTOR CUSTOMERS:
FOR SPECIAL PRICING
CALL 0603 695051

IN THE MODE

Designer display expert **DAVID ACTON** swings in to tell you how you can get the Arc's screen into shape

Do you remember the time when the BBC micro had just eight screen modes? Around the time footballers wore long trousers and butter cost threepence a ton. But in these days of Arcs there are so many modes it's difficult to find cupboard space for them.

Where, we might ask, did they all come from? What, we could continue, are they all for? And how, we may tiresomely persist, can we create our own new screen modes? Simple.

The first step in the mode maze is to realise what modes are all about. Broadly speaking, there are two sorts – graphics (the largest category) and non-graphics (the teletext mode and the so-called 'gap' modes 3 and 6).

Graphics modes can be subdivided according to the number of colours available – 2, 4, 16 or 256, or by their resolution vertically or horizontally.

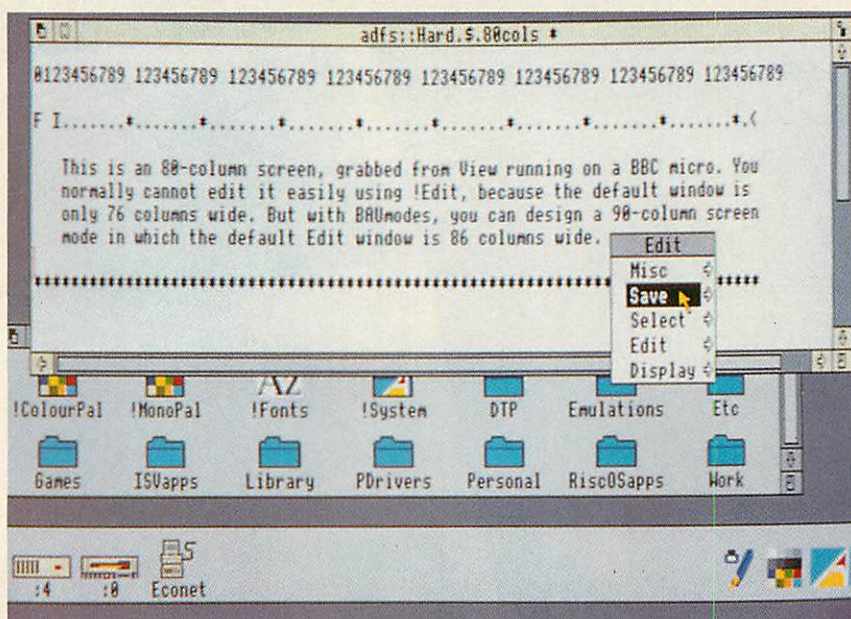
Details of the basic screen modes can be found in your User Guide or Programmer's Reference Manual.

Prior to Risc OS most programs that did anything at all interesting or pretty were mode-dependent and fell over in a heap if run in a different mode. The Risc OS philosophy dictates that programs that live and breathe in the desktop environment should be 'mode-independent'. However dreadful your beautiful 256-colour mode 15 program may look in mode 0, it should at least be usable.

That is the rule. And, to this end, Risc OS makes it surprisingly easy to write mode-independent programs.

The feature of Risc OS which really brings this mode-independence lark into its own though, is how easy it makes the business of designing your own 'custom' screen modes. Having done so, you can be sure that the desktop and all 'well-behaved' applications will function perfectly in your new mode.

Before coming to the actual technique of designing modes, it's worth first pondering over what makes a mode in the first place.



Each mode is defined in two parts. The first consists of a set of values for 'mode variables'. These are numbers used by Risc OS (and which can be read by the user) which define the mode in terms of number of colours, resolution, size of screen in bytes and so on.

Secondly, each mode is also defined in terms of parameters sent to the video controller chip, VIDC (Very Ingenious Display Contraption). More on these later.

Listings 1 and 2 on the yellow pages illustrate a couple of system calls which can be used to read mode variables and which you may well want to use when experimenting with different modes. Run listing 1 and enter a (valid) screen mode. A command of the form:

`SYS "OS_ReadModeVariable",m,n TO ,,v`
reads the value of mode variable n in mode m and returns it in v . You'll find a list of mode variables in the Programmers Reference Manual, but listing 1 reads two of them – 0 (mode type) and 3 (maximum logical colour).

You'll also note the use of `SYS` `OS` `CheckModeValid` to see if the mode you've

chosen is valid or not. If not, it returns a mode number (realmode% in listing 1) which is the mode that will actually be chosen if you try to select the invalid one.

Modes can be invalid if they are not defined, require a special sort of monitor or need more screen memory than is currently available.

Whereas `OS_ReadModeVariable` can be used to find details of a mode other than the current one, the call `OS_ReadVduVariables` is called to find out information about the current mode. A list of mode variables is provided in a table (terminated with -1) and a list of corresponding values is returned. Listing 2 illustrates this, showing the default graphics window in mode 15. (Note that the co-ordinates are ‘internal’ – that is, as Risc OS might use them.)

To see the differences between standard Risc OS modes (and any you might define yourself) you might like to use listing 3 which is a mode testcard. It makes use of `OS_ReadVduVariables` to discover information about the selected mode, then draws a pattern and displays information appropriately. The program begins by printing a list of

valid modes. Again, `OS_CheckModeValid` is used and, to speed things up, the variable `swicmv%` is used instead of the full title of the call. Even so, it takes a little while to check out which modes are okay because it has to ask around for each possible value.

Only numbers between 0 and 255 are checked for validity. (In fact, only modes up to 127 are really valid although, perhaps as an aftermath of shadow screen memory on Masters, 128 to 255 are 'shadow' versions of 0 to 127).

Variables are set according to the particular mode selected and their meanings are summarised in table 1.

Using these variables, information about

<code>modeflag%</code>	graphics/non-graphics flag
<code>columns%</code>	number of text columns
<code>rows%</code>	number of text rows
<code>colours%</code>	actual number of colours available
<code>xpix%, ypix%</code>	horiz, vert number of pixels
<code>xeig%, yeig%</code>	factors by which <code>xpix%</code> and <code>ypix%</code> must be adjusted to provide value for MOVE, PLOT, DRAW, etc
<code>xcharsize%, ycharsize%</code>	characters size plotted with VDU 5

Table 1 – Testcard variables

the mode is displayed in boxes over the background pattern in as 'mode-independent' way as possible outside the desktop.

And so to the design of new modes. Mode definitions are stored in relocatable modules. Those of you who have not programmed in Arm code, or have not read about modules in Risc Revue please stay tuned! There is little to grapple with and the Arm code required is minimal.

Enter and run listing 4. It will ask you a series of questions. Feed it with details about the mode you want to design and then give your new mode a number (123 is suggested). The module containing your mode is then saved (with a name of your choice) and installed. Finally your new mode is selected, so try it out!

The module itself contains very little. It begins with a standard header which, in this case, consists largely of `EQUED 0`. The only piece of Arm code in the module begins at `.service`.

This listens for a service call which is made by Risc OS when an unknown mode has been selected.

If this service call (number &50) is made and the mode chosen is ours then we 'claim' the call (with `MOV R1,#0`) and tell the operating system where it can find two tables.

The first is a set of values that need to be programmed into VIDC, the second a set of mode variables of the sort we have seen earlier. To reduce the amount of work needed, each new mode is based on an existing one, so that any details you don't supply are assumed to be the same as the base mode.

For example, if you were defining a wide two-colour mode you might base it on mode 0 and only specify those parameters con-

cerning the width. You should always choose a base mode with the same number of colours required for the new mode – this saves programming the palette registers of VIDC. Listing 4 sorts this out automatically, choosing a base mode 0, 8, 12 or 15 as appropriate.

Run listing 4, design a new mode and try it out in the desktop.

The usefulness of particular varieties of mode does depend on the sort of monitor you have.

I've found that a 92 by 33 character 16-colour mode is very usable on my standard Arc monitor though.

The table of mode variables begins at `.wslst`. The first word should be zero (allowing for future expansion).

Next comes the base mode and then a list of pairs of values terminated with -1. Each pair consists of a mode variable and its value for our new mode (as will be read by `OS_ReadModeVariable`).

All should be self-explanatory but refer to listings 1 and 2 if it helps.

The VIDC list looks a little odd because of the odd way VIDC is programmed. VIDC has several registers (summarised in table 2) but rather than putting the desired data into a memory location to program such a register, the data is included in the address of the register.

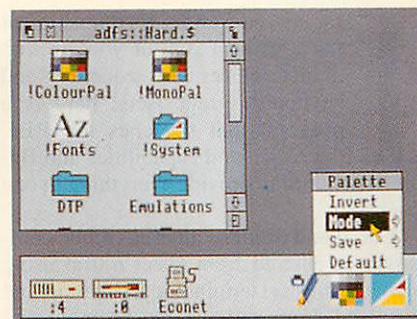
The practical upshot of this is the list (at `.vidclist`) consists of a set of register numbers shifted left by 24 plus the appropriate data shifted left by 14.

If you really want to know why, have a look at the VIDC manual but for the purposes of designing new modes it is enough to know what the main registers are for. Just follow the example of listing 4.

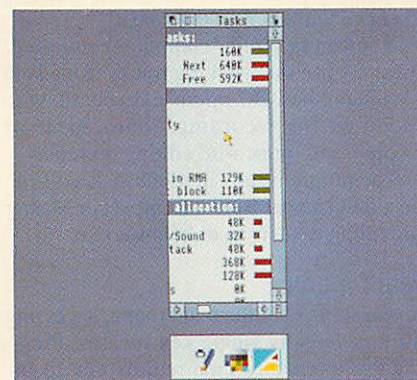
REGISTER	PURPOSE
<code>%10000000</code>	horizontal cycle - time taken to display a line and 'retrace'
<code>%10000100</code>	horizontal sync width - how long the HSYNC pulse lasts
<code>%10001000</code>	horizontal border start
<code>%10001100</code>	horizontal display start
<code>%10010000</code>	horizontal display end
<code>%10010100</code>	horizontal border end
<code>%10100000</code>	vertical cycle
<code>%10100100</code>	vertical sync width
<code>%10101000</code>	vertical border start
<code>%10101100</code>	vertical display start
<code>%10110000</code>	vertical display end
<code>%10110100</code>	vertical border end

Usually, horizontal registers are programmed in 2-pixel units, vertical ones in 1-pixel units. Adjustments should be made depending on number of colours used. Other VIDC registers control cursor, interlace and sound.

Table 2 – VIDC registers



It is easy to design different modes



Essentially, the number of pixels across the screen in your mode is subtracted from the total number VIDC can display.

The remainder is 'shared' out so that the border occupies about half of the space off each side of the screen and the displayed area is central.

The same principle is applied vertically. The only VIDC parameters that are fixed (and not calculated from the data you enter) are `hcycle%`, `vcycle%`, `hwidth%` and `vwidth%`. These have the values they do because of

the base modes used (0, 8, 12 and 15). Changing them may result in the breakdown of the picture. Look at table 2 for more details.

Useful new modes might include an 84-column 16 colour mode for editing text – window borders mean you can't edit 80-column text in mode 12 on the desktop. Video applications might also require a particularly wide and deep mode so that the 'safe area' is completely covered. (And if you have any further thoughts or suggestions, send them in to Risc Revue).

Finally, should you wish to use a 'new' mode commercially you should ask Acorn for an 'official' mode number in writing.

But hurry – there aren't many left!

If you need a chord accompaniment for a brilliant solo or you are into drum machines, bass sequencers and keyboard synthesisers, here is a program that stretches the BBC micro's sound capabilities and Basic to the limit to provide everything in one package.

Chord and drum sequences can be composed or entered from sheet music using standard musical terminology. Rhythms and bass and drum patterns can be input and varied from the keyboard as the music is playing. Instruments can be synthesised and changed without missing a beat!

You can generate 'computer composed' music or use the 'backing tracks' for a solo played on the BBC micro's keyboard, with facilities for recording, auto-repeat of 'loops', and 'punch-in' editing on replay.

The program runs in mode 7. It will run on a BBC model B, B+, Compact or Master providing PAGE is at or below &1300.

Main menu

Strum starts with the main menu, accessing all functions by single key presses. Pressing ESCAPE at any time returns you to the main menu with parameters unchanged but sequences will begin again from the start. Below the main menu is a table of presets that are accessed with the function keys.

The presets can be changed by loading sets of parameters previously saved on disc or by pressing the default keys.

You can quit the program from the main menu, saving any presets or sequences first, by pressing Q. The computer is left in Basic, mode 7, with normal cursor, auto-repeat, and editing functions. Selecting C allows you to enter or edit a chord sequence.

Up to 50 chords can be entered in a sequence. If a sequence has already been entered, it will be displayed. Any chord can be edited by moving the highlight using the cursor keys and entering the new chord. New chords added at the end of the sequence advance the cursor automatically. TAB deletes the chord, COPY inserts a blank



BEAT

If you thought BBC micro music programs were all washed up then think again; this ultimate masterpiece from **MIKE SMITH** will get your fingers tapping

MASTER

space and each new entry must be followed by RETURN. The note 'root' (A-G) should be entered first. Upper-case accents the whole chord. A sharp (#) or a flat (v) adjusts the root note accordingly.

Chord notes are determined by the suffix added. Major chords need no suffix, except major sevenths which require 'M7' to distinguish them from dominant sevenths. All minor chords need 'm'. Augmented, Diminished, and Suspended fourths are entered with the usual musical terms. Sixths, Sevenths, Ninths, Elevenths, and Thirteenth can be added. Chords can be repeated with / and rests introduced with '. A series of chords can be repeated by enclosing them within brackets '()', with nested loops up to 10 deep. The whole sequence will repeat when played.

User-defined chords, scales or harmonies can be set up on the preset function keys, as explained later, and entered with k or K followed by the function key number.

Drums and wires

Up to 50 drum patterns can be entered, using the presets defined on the function keys. There is no need to press RETURN. If a sequence has been previously entered, it will be displayed and can be edited by moving the highlight with the cursor keys and entering a new pattern.

Patterns added at the end of the sequence advance the cursor automatically. TAB deletes a pattern, COPY inserts a copy of the pattern highlighted. Again, a series of drum patterns can be repeated by enclosing them within brackets with nested loops up to 10 deep.

Playing around

Pressing P from the main menu starts the sequences playing but it is not essential to enter either a chord or a drum sequence to play. Pressing a function key repeats the drum pattern and any function key with SHIFT repeats the chord. f0 or SHIFT-f0 stops them.

If a chord or drum sequence has been entered, it will start playing from the start of the sequence, automatically repeating at the end. The sequences are independent but the timing of notes and hits is synchronised.

If a function key or function key with SHIFT is now pressed, the preset drum pattern or chord will override the sequence until f0 or SHIFT-f0 is pressed to return to the sequence. This allows 'in-fills' or occasional variations in harmony. The sequence of chords is displayed, and the current drum pattern is highlighted. There are numerous parameters shown on the Play menu, which can all be varied, or toggled on or off with single key presses. Values of variable parameters are indicated, on states are highlighted in red and off in yellow.

The tempo is the time taken in 1/100s to play all the notes in a bar. It can be increased or decreased by the number of beats in a bar using the cursor keys, or by 10 times with SHIFT.

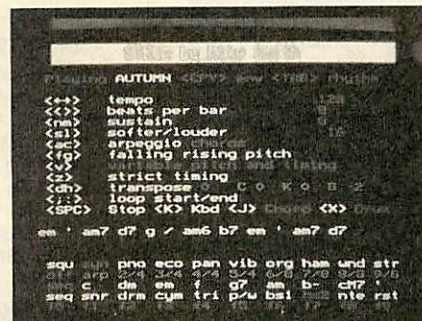
The beats per bar value (altered with < and >) is strictly per chord. If a rhythm or drum pattern is playing with more notes, the remaining notes will not play, and if less, there will be a rest for the remaining beats.

Sustain (n and m) refers to the length of each individual note (as distinct from tempo or beat settings) in 1/20 secs. It allows notes to be played staccato, legato, or overlapping to create sustained chord arpeggios like vibes or organ. It can have a great effect on the sound of an instrument as set by the envelope parameters and is worth experimenting with.

The softer/louder value (s and l) is the relative difference in amplitude and relates to the attack and decay levels in the envelope parameters for unaccented notes. Accented chord, drum, bass or keyboard notes are not affected. The overall volume cannot be changed with software.

Unless a rhythm preset has been selected, the arpeggio chords switch (a and c) determines the way the chord is played. Chords play three notes simultaneously if the keyboard is off, and two notes otherwise. The chord inversion is determined by the note selected for each beat. The falling/rising switch (f and g) is for arpeggios, but also affects any bass line and the chord inversion if 'chords' are selected.

Variable pitch and timing (v) selects notes at random, although biased to the centre of the chord. Timing is de-synchronised to allow notes to play singly or in chords at random. This can be modified by pressing



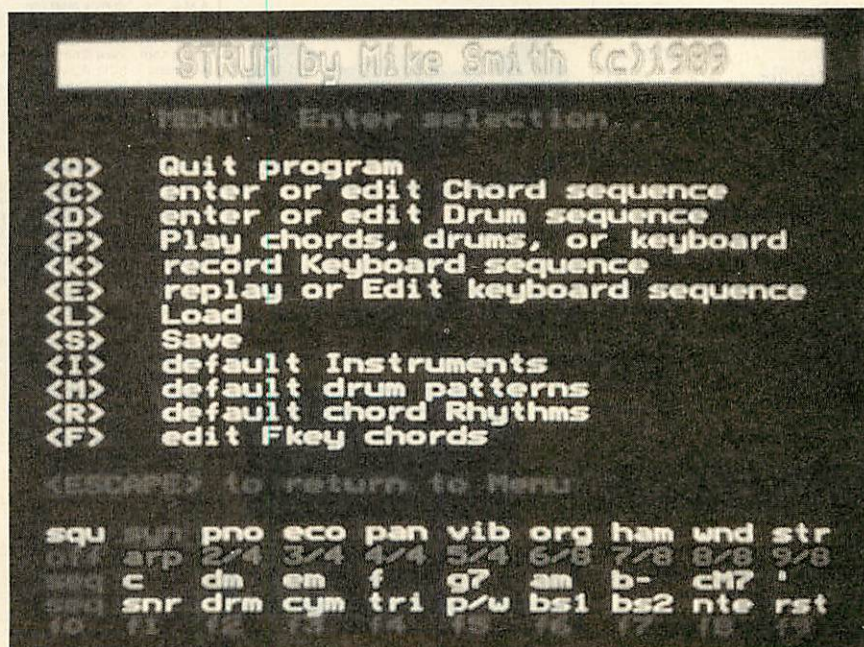
A or C. If strict timing (z) is switched on, a note is played on every beat. If off, the program chooses a length of note at random, up to four times the length of a single beat.

All notes can be transposed (d and h) by a semitone for each keypress, in unison over an octave range. The number of semitones from the original setting is shown. However, if SHIFT is pressed as well, the keyboard, chords, or bass are raised or lowered by a whole octave.

This operates on a priority basis. If the keyboard is on, only the keyboard will be changed. If the keyboard is off and chords on, only the chords are transposed. But if both keyboard and chords are off, the bass will be changed. The current octave is shown for each in relation to the initial chord setting.

Stop (SPACE) of course stops or restarts the music. It is a useful function as the various settings can still be changed by single keypresses. Also, the keyboard can be played but with no 'quantisation'.

The keyboard switch (K) toggles the keyboard on or off. The keyboard has a range of two octaves, from C at TAB to C at the up cursor key. 'Black' notes are on the row above, from 1 to \. If Stop is off, the key-



	BASIC	COLOUR
A3000 1meg	£671.21	£899.41
A3000 2meg	£820.71	£1048.91
A410/1	£1240.96	£1468.66
A420/1	£1758.46	£1986.16
A440/1	£2586.47	£2814.16



COMPUTERS ON OUR SUPER BUY NOW PAY LATER SCHEME PLEASE TELEPHONE

BUY NOW PAY LATER PRICES

WITH 3 MONTHS TO PAY 10% DEPOSIT

	BASIC	COLOUR
A3000 1meg	709.03	949.38
A3000 2meg	858.53	1098.88
A410/1	1309.90	1550.26
A420/1	1856.16	2096.60
Master 128	479.60	706.60
Amiga Bat Pack	389.99	617.69
Atari ST 520	389.99	617.69

ALL our prices
include V.A.T.

Master 128	£454.37
Cambridge Z88 Lap Top	£218.44
Panasonic KX P1081	£159.00
Panasonic KX P1180	£216.55
Citizen 120D	£149.00
Sekosha SL80 24pin	£287.00
Star LC10	£178.71
Star LC10 Colour	£223.50
Philips 8833 colour	£260.50
Philips 8801 colour	£194.95
Philips 8832 colour	£229.63
Tatung Colour Std/Res	£175.00
Ahktar 40/80 400K Sgle no PSU	£99.37
Ahktar 40/80 800K Dual no PSU	£199.76
Ahktar 40/80 400K Sgle & PSU	£131.69
Ahktar 40/80 800K Dual & PSU	£276.20

OAK COMPUTERS

20 Mb Ext HDisc (B & Master)	£595.41
SCSI 20Mb Add HDisc A3/410	£475.24
SCSI 20Mb Ext HDisc A3000	£584.49
SCSI 45Mb Add HDisc A3/410	£606.34
SCSI 45Mb Ext HDisc A3000	£715.59
SCSI Card for A3000	£217.41
SCSI Card for A3/410	£217.41

COMPUTECK Ltd.

Dinting Lane Industrial Estate
Glossop
Derbyshire SK13 9NU
Visa-Master-Lombard Cards
Telephone 0457 865953
Telefax 0457 869917

ACORN SOFTWARE

Desk Top Publisher (A)	£137.08
ISO Pascal ROM (BMC)	£55.20
Lisp (BMC)	£18.40
Logistix (A)	£102.46
Micros in Business (BMC)	£39.95
Twinn (A)	£30.00
View 3.0 (B)	£47.84
View Index (BMC)	£11.96
View Plot (BMC)	£23.95
View Professional (BMC)	£79.94
View Sheet (BMC)	£47.84

COMPUTER CONCEPTS

Inter-Base (BMC)	£55.20
Inter-Chart (BMC)	£29.44
Inter-Sheet (BMC)	£45.08
Inter-Word (BMC)	£45.08
Inter-Chart (A)	£23.00
Inter-Sheet (A)	£35.88
Inter-Word (A)	£35.88
Mega 3 Rom (BMC)	£87.99
Spell Master (BMC)	£47.19
Impression (A)	£154.22

CLARES MICRO SUPPLIES

Alpha Base (A)	£44.94
Arfisan 2 (A)	£53.95
Toolkit (A)	£35.95
Interdictor (A)	£31.45
Knowledge Organiser (A)	£53.95
Fontwise package (BMC)	£26.99

IMPACT SOFTWARE

Arcade Soccer (A)	£17.95
E-Type (A)	£17.95
Holed Out (A)	£17.95
U.I.M. (A)	£26.95
White Magic (A)	£17.95
The Olympics (A)	£17.95

PRES

Adv. Control Panel (BMC)	£32.08
Adv. Disc Investigator (BMC)	£26.73
Adv. Disc Toolkit (BMC)	£32.08
Adv. File Manager (BMC)	£25.87

PRES Archimedes products less 10%

MINERVA SYSTEMS

System Delta+Card Index (BM)	£58.45
System Delta Plus (A)	£71.95
Atelier (A)	£89.95

DABS PRESS

Master Guide Book	£11.65
Viewstore/Sheet Book	£11.65
View Guide Book	£11.65
"C" A Dabhand Guide	£13.45
Z88 A Dabhand Guide	£13.45
Archimedes Beginners Guide	£8.95



Trade-in with Confidence

P M S

Genie in a Box (BMC)	£71.41
Genie Junior (BMC)	£22.49
Genie Master Cartridge (M)	£71.41
Genie Utilities (BMC)	£8.94
Genie Real Time Clock (BC)	£26.08

This advert contains just
a few of the items we have
Please telephone or send a
SAE for our FULL price lists

We specialise in "Trading In" and
buying Used Hardware & Software

Post and Packing Charges
£1.00 for small, £2.45 for medium items.
Expensive products £8.50 for courier

USED STOCK SELECTION

COMPUTERS & HARDWARE

Acorn	BBC B 1770 DFS Series 4	264.50
Acorn	BBC B 1770 DFS Series 7	287.50
Acorn	BBC B 8271 DFS Series 4	264.50
Acorn	Z80 Second Processor	161.00
Misc.	Z80 Second Processor	103.50
Misc.	Zenith Green Screen	46.00
Viglen	Single Drive 40/80 no PSU	64.40
A T P L	Sideways ROM/RAM Board BBC	28.75
Acorn	Master ROM Cartridge	9.20
Acorn	Prestel Adaptor (BM)	46.00
Acorn	Speech Upgrade BBC B	17.25
Acorn	Teletext Adaptor	46.00
Acorn	Twin Joysticks (B)	9.20
Database	Z88 to BBC Link	16.10
Misc.	Cheetah Mach I Joystick	11.50
Misc.	Cheetah Speech System BBC B	13.80
Misc.	Della 14b Joystick (B)	9.20
Misc.	Della 3B Joystick (B)	5.75
Misc.	Della 3a Joystick	4.60
Misc.	IFEL 16K Sideways RAM Module	15.00
Misc.	Magic Modern V21/V23	69.00
Misc.	Printer Sharer 6 Comps to 1 P	184.00
Misc.	Prism Modern 1000 Inc Software	69.00
Misc.	Prism Modern 2000 Inc Software	69.00
Misc.	Terrel printer Sharer Box	26.45
Misc.	Timer Kit	9.20
Misc.	UV Stat Epimer	19.55
Morley	AA Board (M)	28.75
Morley	Care dual 2 x 16K cartridge	9.20
Morley	Quad Cartridge 4 x 16K	11.50
Nidd Vail	Digimouse & Grafik (B)	28.75
PRES	Advanced Rom adaptor MK II	9.20
Soldisk	Teletext Adaptor	69.00
Viglen	Cartridge System for BBC B	9.50
Vine	ROM Board 3 (M)	11.50
Walford	16K Disc RAM Board (B)	23.00
Walford	Aries B20 RAM Board (B)	34.50
Walford	Quest Mouse & Paint	40.25

BOOKS

Acorn	Advanced User Guide BBC	10.00
Acornsoft	Programmers Ref Manual (A)	19.95
Acornsoft	View Ref Manual	6.00
Misc.	100 Progs for the BBC B	3.00
Misc.	30 Hour Basic	4.00
Misc.	36 Games for BBC	3.00
Misc.	Adv'd Prog'm'g BBC / Mike James	3.00
Misc.	Assembly Lang Prog I Blinbaum	4.00
Misc.	Assembly Lang. by J Ferguson	4.00
Misc.	Basic Programming BBC	3.00
Misc.	Basic ROM User Guide Plumley	6.00
Misc.	BBC Ass. Lang. Bruce Smith	4.00
Misc.	BBC Basic by A P Stephenson	3.00
Misc.	BBC Disk Companion / T Latham	3.00
Misc.	BBC Revealed by J Rushlon	2.00
Misc.	Beyond Basic / R Freeman	4.00
Misc.	Business Programming BBC	4.00
Misc.	Companion to BBC Micro	3.00
Misc.	Disk Systems for BBC I Sinclair	3.00
Misc.	Expert Guide to BBC M James	3.00
Misc.	Further Prog'm'g / A Thomas	2.00
Misc.	Further Programming P Bishop	5.00
Misc.	Graphics & Sound by S Money	3.00
Misc.	Graphics Book and Tape (B)	5.00
Misc.	I'Facing & Control on BBC	5.00
Misc.	Learning Prog'mg Tam Conlon	5.00
Misc.	MC56500 Manual	4.00
Misc.	The Book of Listings	2.00
Misc.	Utilities for BBC / J Aughton	3.00

SERIOUS SOFTWARE

A M S	3D Zoon (BM) Disc	13.80
A M S	AMX Art & Paint Pat (B) ROM	25.00
A M S	AMX Design (BM) ROM	34.50
A M S	AMX Super Art ROM (B)	26.75
A M S	Extral Extra (BM) Disc	13.80
A M S	Mouse & Super Art (M) Disc	34.50
A M S	Slop Press (B) ROM	28.75
A M S	Slop Press Discs (M)	28.75
A M S	Utilities (BM) Disc	8.06
Acorn User	User Dump ROM	13.80
Acorn User	User Rom	13.80
Acornsoft	View Chart (BM) Disc	6.90
Acornsoft	BCPL ROM (B)	36.01
Acornsoft	BCPL Stand alone Gen (BM) Disc	13.80
Acornsoft	Business Games (B) Tape	3.45
Acornsoft	Database (B) Disc	8.05
Acornsoft	Fairtan 77 (A) Disc	69.00
Acornsoft	GXR ROM (B) ROM/Tape	19.00
Acornsoft	Hi - View (B) Disc	25.30
Acornsoft	Unknowd Geiman (Tape)	11.50
Acornsoft	Unknowd Italian (Tape)	11.50
Acornsoft	Logo (E) ROM & Tape	18.00
Acornsoft	Magic Mushrooms (B) Disc	3.60
Acornsoft	Maze (B) Disc	3.45
Acornsoft	Overview (B) ROM	57.50
Acornsoft	Printer/Driver Gen. (BM) Disc	6.90
Acornsoft	View (BM) ROM	34.50
Acornsoft	View Index (BM) Disc	6.90
Acornsoft	View Plot (C) Disc	17.25
Acornsoft	View Spell (BM) ROM & Disc	25.00
Acornsoft	View Store (BM) ROM	34.50
Acornsoft	Viewsheet (BM) ROM	34.50
Acornsoft	Workshop (B) Disc	6.90
BBC Pubs	Music (B) Tape	4.60
BBC Pubs	Rainfall (B) Tape	3.45
BBC Pubs	VU-Type (B) Tape	6.90
Beebug	Asiadd (M) Disc	6.90
Beebug	Billboard (B) Disc	9.20
Beebug	Design (B) Disc	11.50
Beebug	Exmon II (B) ROM	17.25
Beebug	Help (ROM) (B)	11.50
Beebug	Masterfile (B) Disc	13.80
Beebug	Paintbox (B) Disc	9.20
Beebug	Printwise (BM) Disc	17.25
Beebug	Quickcalc (B) Disc	9.20
Beebug	Rommit (B) ROM	23.00
Beebug	Sleuth (B) ROM	20.70
Beebug	Spellcheck (B) Disc	11.50
Beebug	Spillies (B) Disc	6.90
Beebug	Studio 8 (B) Disc	13.80
Beebug	Teletext (B) Tape	4.03
Beebug	Teletext Pack (B) Disc	8.05
Beebug	Toolkit (B) ROM	13.80
Beebug	Toolkit Plus (B) ROM	20.70

Beebug	Vocab Tester (B) Tape	9.20
Clares	Airroom (C) Disc	17.25
Clares	Airroom (M) Disc	13.80
Clares	Airroom Pack (C) Discs	23.00
Clares	Airroom/Ace (M) Discs	17.25
Clares	Bela Base (B) Disc	16.50
Clares	Biom Plus (BMC) ROM	17.25
Clares	Gradisc (B) Disc	6.90
Clares	Replica III (B) Disc	8.05
Comp Con	Carrelaker (B) ROM	13.80
Comp Con	Communicator (B) ROM	34.50
Comp Con	Graphics (BM) ROM	17.25
Comp Con	Gremiln (B) ROM	17.25
Comp Con	Inter-Sheet (BMC) ROM	34.50
Comp Con	Inter-word (A) ROM	34.50
Comp Con	Printmaster (BMC) ROM	17.25
Comp Con	Wordwise (BMC) ROM	20.70
Dabs Pres	MOS Plus (M) ROM	8.05
Database	Arcade Game Creator (B) Disc	11.50
Database	Graphic Adv. Creator (B) Tape	6.90
Incentive	Graphic Adv. Creator (B) Disc	13.80
Incentive	Music System II (B) Tape	6.90
Micro Pow	Basic Extension (B) ROM	17.25
Minerva	Sigma Sheet (A) Disc	46.00
Mirror	Admin Extra (B) Disc	8.05
Mirror	Feet Sheet Editor (B) Disc	28.75
Misc.	MARK Disassembler by Slogger	10.50
Misc.	ADEx (M) 2xROM	34.50
Misc.	ADU by Pineapple (BM) ROM	17.25
Misc.	AIDS II by Soft Smith	9.95
Misc.	Cashbook by Mario Ald Disc	9.50
Misc.	Dalprint & Teletextatic ROM	13.80
Misc.	Family History Major Aid (A)	17.25
Misc.	Graphics Pack (B) Tape Salaman	3.45
Misc.	Graphilo (B) Disc	6.90
Misc.	Graphilo (B) Tape	5.75
Misc.	Health Data (BM) Disc	6.90
Misc.	Image by Cambridge (B) Disc	17.25
Misc.	Image V2 (E) Tape Copier	4.90
Misc.	Instant Recall/D/base (B) Tape	6.90
Misc.	Mega Maths 'A' Level 2 x Disc	17.25
Misc.	Oxford Pascal (B) ROM/Disc	45.00
Misc.	Punctuator (B) Disc	9.20
Misc.	RE Light Pen (B)	9.20
Misc.	Sciways (BM) ROM	25.00
Misc.	Share Analyser - Synergy Soft	19.95
Misc.	Slave & ROM (B)	23.00
Misc.	Spy (B) ROM	13.80
Misc.	Supermarket (B) Disc	11.50
Misc.	Vector I Tape to Disc	6.90
Misc.	Vector 2 Disc to Disc	6.90
Misc.	View Guide & Utls (BM) Disc	8.05
Misc.	Visual-Viewdata (B) ROM	23.00
Misc.	Vu-Calc (Pison) (B) Tape	9.20
Misc.	VU-File (B) Tape	11.50
Misc.	Wordwise Books/Disc P Beverley	9.95
Misc.	XOR Designer (B) Disc	10.35
Misc.	ZOOM Mach. Code Monitor (B)	11.50
Misc.	Time Watch (A) Disc	19.95
Misc.	Master Copy (M) ROM	9.20
P M S	Genie Cartridge (M)	34.50
P M S	Genie Utls (BM) Disc	4.60
Pace	Commstar (BM) ROM	17.25
Pace	Microtel Terminal (B) ROM	9.20
PRES	Adv'd Disc Toolkit (BM) ROM	23.00
PRES	Adv'd ROM Manager (BM) ROM	9.20
Soldisk	ADFS (B) ROM	13.80
Superior	Speech! (BM) Disc	4.60
Walford	Beebom (B) ROM	23.00
Walford	Colour Art (B) Disc	6.90
Walford	Office Mate (B) Disc	6.90
Walford	Quest! Fonts Disc (BM) Disc	11.50

GAMES

Acornsoft	Arcade Action (B) Tape	1.73
Acornsoft	Aviator (B) Disc	8.05
Acornsoft	Boxer (B) Disc	4.60
Acornsoft	Carousel (B) Disc	4.60
Acornsoft	Cube Master (B) Tape	2.30
Acornsoft	Elle (C) Disc	8.05
Acornsoft	Free Fall (B) Disc	4.60
Acornsoft	Hits Vol 1 (C) Disc	6.90
Acornsoft	Me & My Micro (E) Tape 8 Games	1.73
Acornsoft	Meleors (B) Tape	2.30
Acornsoft	Monsters (B) Disc	4.60
Acornsoft	Planetoid (B) Disc	4.60
Acornsoft	Revs (B) Disc	6.90
Acornsoft	Revs (BM) Tape	4.60
Acornsoft	Rocket Rald (B) Tape	2.30
Acornsoft	Snapper (B) Disc	4.60
Acornsoft	Snapper (B) Tape	1.73
Acornsoft	Slarship Command (B) Tape	2.30
Acornsoft	Super Invaders (B) Tape	1.73
BBC Pubs	White Knight II (B) Tape	4.60
CDs	Birdie Barrage (B) Tape	1.73
Domark	Nol a Penny More (B) Disc/Book	6.90
Domark	Trivial Pursuit (B) Tape	4.60
Domark	Trivial Pursuit (B) Disc	6.90
Flebird	Cholo (B) Disc	6.90
Leisure G	Kensington (B) Tape	3.45
Leisure G	Scrabble (B) Disc	6.90
Leisure G	Scrabble (B) Tape	3.45
Melborne	The Hobbit (B) Tape	3.45
Melborne	Way of the Expl Fst (B) Disc	6.90
Micro Pow	Castle Quest (B) Disc	4.60

board will start and stop notes 'on the beat'.

The chords switch (C) toggles chords on or off. The sound stops but the chords are still displayed, giving a visual indication of the sequence. Bass or chord notes in the drum patterns play according to the chord displayed.

Finally, the drums switch (X) toggles drum patterns on or off. The sounds stop but the current pattern is still highlighted on the function key table.

Function keys

The function keys used with SHIFT and CTRL select the instrument presets. If the keyboard is on, the keyboard instrument will change, otherwise the chords instrument. So, it is possible to have two different instruments (as well as the drum and bass sounds) playing at the same time.

The rhythm presets are selected with function keys and CTRL. These are preset sequences of notes played in a chord, instead of automatic selection. The beats per bar are automatically adjusted to suit the rhythm. The preset chords are selected with function keys plus SHIFT and the function keys alone select the preset drum patterns.

All enveloping

While in Play mode, pressing COPY will enter the dynamic envelope menu. This allows you to alter the parameters of the current instrument with single key-presses while playing chords. It is a very powerful feature allowing the effect to be heard immediately.

The current parameters are displayed. Use the up and down cursor keys to select the parameter and alter the value with the left and right keys, one unit at a time, or 10 units by pressing SHIFT as well.

The altered parameters will be shown, with the current one highlighted. The initial settings remain displayed for comparison.

You can select another instrument at this stage, using the function keys with SHIFT and CTRL.

First you have the option of changing the three letter name, pressing RETURN to continue. In this way, a whole bank of different presets can be created (and saved to disc from the main menu). Pressing COPY returns to the Play menu.

Rhythms that stick

While in Play mode, pressing TAB enters the interactive rhythm mode. This allows rhythms and drum patterns to be varied – while they are playing.

Below the menu, three lines of notes are

displayed, showing the current rhythm notes, accents, and drum hits. Above them a red V indicates the note being edited. This can be moved left or right with a comma or a fullstop – not to be confused with the beats per bar setting which is changed with < and >, using SHIFT. The tempo is altered with the left and right cursor keys (with SHIFT for steps of 10) as before.

Chords are composed of seven notes, 1-7, plus 0 for a rest. The rhythm sequence for each chord can be up to 32 notes long, repeating the seven notes or the rest in any

required bass line can then be set up on the rhythm sequence.

Pattern presets can be entered or edited on any function key by pressing the required one with CTRL for rhythms, or by itself for drums, while in Rhythm mode. First you have the option of changing the three letter name, pressing RETURN to continue.

Notes or hits can be added to the rhythm or drum sequence by moving the cursor to the next space after the last note and entering the required symbol. The cursor advances automatically.

The number of beats per bar will increase with the rhythm pattern only. Note that rhythms and drum patterns are extended independently, depending on the symbols entered.

A rhythm pattern can be shortened by DELETE, drum patterns by pressing SHIFT-DELETE. The number of beats per bar will reduce with the rhythm pattern only.

Pressing TAB returns to the Play menu.

Keynotes

Pressing K in the main menu allows a keyboard sequence of up to 512 beats to be recorded.

Before starting to record, four time signals are played. Keyboard notes are 'quantised' to the current tempo and beat and can take a little practice before you get your timing right! ESCAPE ends the recording.

This ensures that rests are added to the keyboard sequence so it repeats from the start of any chord sequence when replayed or edited.

To replay your recording, press E from the main menu.

You can speed up or slow down the tempo, or change any of the Play parameters to alter the accompaniment.

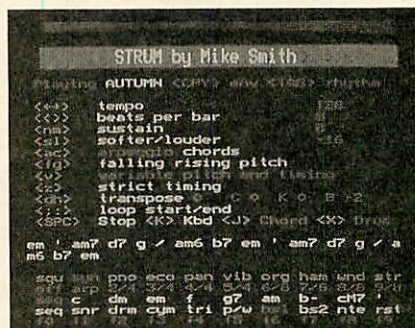
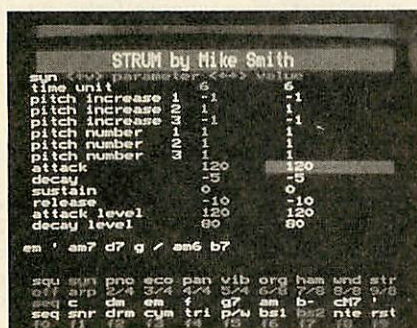
Different instruments can be tried or other presets changed. You can edit your recording by playing new notes over the top of the original.

This is called 'punching-in' and requires some practice! A note can be deleted or shortened by pressing DELETE.

You can set up a short loop from the recording by pressing ':' at the start and ':' at the end.

The loop will repeat continuously, allowing editing until you are satisfied. Press SPACE to stop the loop and continue with normal replay.

The whole keyboard sequence will repeat automatically, from the start of any chord sequence but independently of drum sequences.



order. A note is accented by pressing @ or not with /.

Normally, the seven notes are defined in ascending order of pitch and are determined by the chord name – 'Am7', 'F6' and so on – but could be any set of notes in a user-defined chord.

The unaccented drum hits are high snare (h), medium snare (m), low snare (l), bass drum (d), brush (r), cymbal (c), triangle (t), falling pitch (f), rising white noise (w), bass (b), chord note (n) and rest (').

The drum hits are accented by pressing SHIFT as well. It is possible to mix any of the drum sounds in one pattern, including bass and chord notes or rests. Selecting chord notes plays the same note as the chord sequence but individual notes can be accented for rhythmic effect.

Also, the same note, if played in the chord, sounds on a different channel which results in interesting phasing effects and a richer timbre.

Bass notes also play the same note as the chord, but normally two octaves lower.

It is possible to toggle the chords off with the bass continuing to play. Any re-

Word

processing
and DTP in one
program • multiple

documents in memory •

multiple windows on each docu-

ment • any scale view from 1%-900% • automatic hyphenation •
built-in spelling checker • spell check as-you-type • **full 24-bit**
RGB, CMYK & HSV colour control • fast character mode
printing • 300K free workspace on a 1Mbyte machine • supplied

with 13 outline fonts • **flowing graph-**

ics with text • automatic contents

and index generation • automatic

file conversion from other WPs •

virtual memory system - un-

limited document size • simple

to use - only 5 main menus • word

count • scaled printing • portrait

& landscape pages in one document

• **active master pages** • different

page sizes in one document •

automatic inter-column rules •

thumbnail printing • rotated print-

ing • left or right only printing •

pamphlet printing • collated print-

ing • pause between pages • cut/

copy/paste between documents •

multiple master pages • **fully cus-**

tomisable start-up • program-

mable key short cuts • styles can be

applied to any part of a paragraph

• overlaying styles • dynamic

memory usage • **search & replace**

for styles and codes • search &

replace with wildcards • case sensi-

tive search and replace • auto-page

numbering • **roman numbering**

option • page numbering start at

any value • multi-line headers &

footers • graphics in headers and

footers • graphics on/off options

for screen & print • style merge

from other documents • style tem-

plate documents • **condensed &**

expanded text • left, centre, right

and decimal tabs • each style can

have its own ruler • single &

double underline options • text

strikeout • underline and strikeout

colour control • **rule-offs** •

hyphenation control on individual

words • hyphenation exception

dictionaries • programmable tab

leader characters • **horizontal**

and vertical kerning to 1/

1000ths em • internal accuracy to

1/72,000ths inch • text flow around

frame control (both sides, either side or

neither side) • guide frames • controllable

frame snap • embedded graphics frames in text • **embedded graphics on the line** • go to
page & chapter • two guess-misspelt-word options • word anagram solutions • crossword
solving facilities • **8 user dictionaries** • auto-load user dictionaries on start-up • user
dictionaries compatible with Spellmaster • **automatic word substitution as you type** •

IMPRESSION

*We are not the only ones who think
Impression is number one.*

Some of the first reviews have said -

"Overall Impression is a very powerful DTP package with a host of features. ...it is exceedingly easy to use, and produces excellent results, both on screen and on paper."

"If you are trying to decide between Impression and Acorn DTP, and you only have a 1Mbyte machine, then there is really no choice. Similarly if you want to use the package as a word processor, then Impression wins again." RISC User. November 89

"The latest and greatest in a fine tradition of word processors."

"Probably the most noticeable difference between the two packages is Impression's much greater speed. It is markedly faster.... and there is practically no waiting for sprite graphics to be drawn."

"A lot of thought has evidently gone into its philosophy and execution, and it is above all fast and powerful" Micro User Jan 1990.

"I have used Pagemaker on the Mac, but there is just no comparison. Impression is so much better integrated from text entry to output management, more intuitive, faster and more flexible." Archive. Nov 1989

"I worked with a pre-release version of the program, but even this demonstrated extraordinary capabilities."

"...the most effective writing tool that I have yet handled."

"Impression is a world class document processor for a world class computer, and manages to be both powerful and friendly at the same time so that it is a real pleasure to use. I expect it to be even more successful on the Archimedes than Wordwise and Inter-Word have been on the ModelB/Master" Gordon Taylor. A&B Computing Dec 1989

Impression - £149.00 +VAT (£171.35)

**Now
Available**

*Impression, the document processor for the Archimedes.
There are more than a few reasons why it is better.*



Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts. HP2 6EX.

Pressing CTRL at the end of a keyboard sequence puts you back in record mode, and allows the sequence to be extended.

Pressing F from the main menu takes you into the chord editor. Press the function key chord you wish to edit. It will be highlighted and the cursor will flash ready for you to input the chord name.

Press RETURN to fix the new chord. If you want to define a chord, harmony or scale press K (or k). A table of pitches will be displayed and each of the seven notes can be entered.

'Micro-tones' of an eighth of a tone can be entered if required. Default chords can be reset by pressing TAB.

Pressing I, R or M from the main menu resets the default instruments, rhythms or drums and updates the function key table.

If you have changed any envelope parameters, rhythms or drum patterns and want to keep them you must save them first.

Menu masters

Finally, the main menu allows sequences and presets to be loaded or saved to disc. You can load or save everything associated with a particular recording or just the chord sequence, presets and any user-defined harmonies, drums sequence and presets, the keyboard sequence, the preset instruments or the preset rhythms. Star commands can also be issued at this stage.

The filenames should have no directory prefix added as this is done automatically to denote the type of file saved.

If the file is not on the disc when loading or already exists when saving, you will be

told so. Use *DRIVE to change the data drive rather than adding a prefix to the filename.

Starting to Strum

To start 'strumming', it's best to first enter a chord sequence. This can be changed or added to and a song structure built-up with repeats as you compose.

Alternatively, enter the chords from a song sheet. Pad out bars with repeat chords if necessary as each chord will have the same number of beats. You can now play the sequence and experiment with tempo, beats per bar, arpeggio, chord and so on.

Different instruments can be tried and the sustain setting varied. Pressing COPY allows you to instantly change the envelope parameters and hear the effect.

Interval (in C)	semi- tone	note	H	M	M7	m7	7	+	s	6	9	11	13
D 16	27	7											
C 15	26												
B 14	25												
	24												
	23												
A 13	22	6											
G 12	21												
	20												
	19												
F 11	18	5											
E 10	17												
	16												
D 9	15	4											
C 8	14												
B 7	13												
	12												
	11												
A 6	10	3											
G 5	9												
	8												
	7												
F 4	6	2											
E 3	5												
	4												
D 2	3	1											
C 1	2												
	1												

Table 1

Now press a function key for a bass line or any other percussion effect. The defaults are examples only and can be changed to anything you like by pressing TAB.

Any percussion effect can be entered into the drum pattern, mixing bass with snares, cymbal and the like, and a hit or a rest will be played on every beat. Change the preset drum patterns to suit your composition and use them in a drum sequence to match the chords.

Rhythm patterns can be matched to the drum patterns and, as up to 32 beats per chord are possible, quite complex structures can be entered. Use this mode with chords 'off' to compose some really funky bass lines!

For the 'solo' use the monophonic keyboard on the top two rows of keys. Press 's' to reduce the volume of the chord accompaniment and play away, with a different instrument or octave range if you wish.

When you are really good at it, record the solo and play back with changes to notes, instrument, timing, or accompaniment. Then everything can be saved to disc.

The whole program is designed to allow you to hear the effect of changes instantly, using single key-presses. At last, you can really play your Beeb!

It is worth noting that the sound of the BBC micro (and therefore from *Strum*) can be vastly improved by feeding the audio signal to a larger external speaker (8ohm) or even to a hi-fi amplifier. However, it is recommended that you should only attempt this if you know what you are doing!

HOW THE PROGRAM WORKS

After initialisation and the main menu display, there are two main loops - PROCplay and PROCstrum.

PROCplay steps through the chord sequence array c\$(c%) - and the drum sequence array p\$(pp%).

If a function key preset is pressed, the sequences are overridden by J% and K% respectively.

The seven chord notes are worked out by PROCchord(chord\$), in accordance with table 1 and held in the array pitch%(J%,n%). The drum hits are held in perc\$, which is chosen from the array seq\$(K%) by PROCperc(d%).

The next loop, PROCstrum, is then called. This steps through the beats of each chord, checking if any key has been pressed, determining which chord notes to play, in sequence, unison or user-defined, sounding the notes with SOUND, and playing the drum hit with PROCdrum(d\$) (where d\$ is the n% character in perc\$).

The timing is determined by setting TIME to zero and waiting until it reaches the

value set by tempo%. Each time through the loop the SOUND channel is incremented to allow chords and arpeggios to 'overlap'. Duration of notes is independent of tempo.

If a key is pressed, it is dealt with by PROCpar(k%) which first checks any keyboard functions with PROCkbd(b%), then envelope or rhythm changes, then any presets and finally alters any of the Play parameters, if required.

PROCKbd(b%) checks whether a previous key is still being pressed by INKEY(-L%). L% is held in memory at kb%?N%, where N% is the position of the last key pressed in Keyboard\$.

If recording or editing, the key pressed is held in memory at kb%?B%, where B% is the current beat.

If no key is being pressed or has been recorded, the keyboard note is silenced by a SOUND statement.

If the same key is still being pressed, the note continues indefinitely or if a key is pressed, a new note is started.

Drum hits are played by PROCdrum(d\$).

This uses channel 0. If the pitch parameter is 3 or 7, the pitch is determined by channel 1. Bass notes are obtained by adding 91 to the pitch of channel 1, giving a note two octaves below the chord notes playing at the same time.

The periodic waveform of channel 0 gives a nice funky bass sound that is quite realistic played through a good amplifier!

The instrument sounds are controlled by ENVELOPE statements stored in array e%(key%,par%), key% being the instrument currently selected, and par% being one of the 12 parameters necessary to define the ENVELOPE.

PROCVaryenv uses the cursor key codes to vary them. As they are then used by SOUND statements elsewhere in the program, the effect can be heard instantly.

PROCVaryrhythm uses similar interactive techniques on strings seq\$, rseq\$ and race\$ to vary drum, rhythm and accent patterns and allowing you to listen for the effect you want, rather than work it all out on paper first!

CLARES

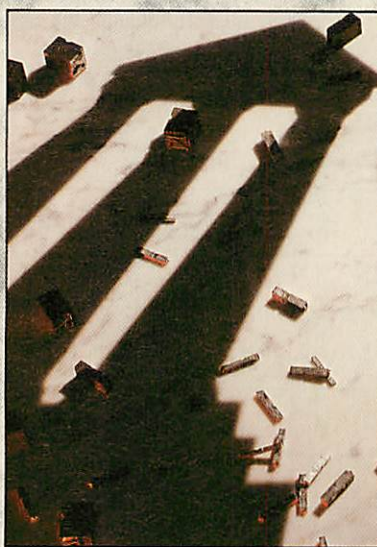


THE · PURE · CLASSIC

The *Tempest*, a pure classic. But, we're not talking about that play by William Shakespeare. Or the endless TV adaptations of the same. Our *Tempest* is on a different screen. It's a desk top publishing package from Clares. But like all classics it sets standards and a style that will always be ahead of the competition.

It is fully RISC OS compatible using the Outline fonts and RISC OS printer drivers.

It has been designed specifically to run on a 1 megabyte BBC A3000 or Archimedes 310 without sacrificing



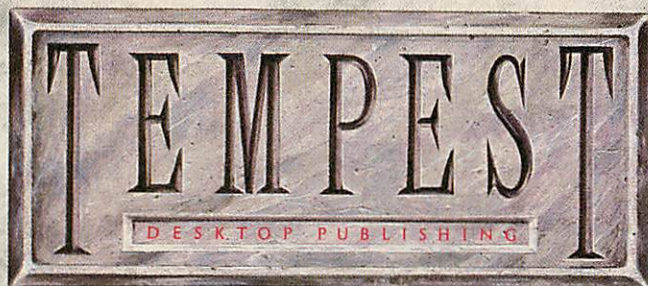
any features or quality.

On an Archimedes 400 series with extra memory you can run *Tempest* and have a bigger font cache as well as huge documents.

Users of the Acorn DTP can be using *Tempest* fully within one hour. And although *Tempest* is more sophisticated than ADTP the initial menus are similar. But it's a lot faster than ADTP. And that's just act one. There are many more star features that allow you to produce a masterpiece from any Desk Top Publishing task.

Tempest DTP. You'll be hooked on this classic.

Special Introductory Offer — £129.95 (inc vat) Education £99.55 (plus vat)



A Classic Desktop Production



98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA.
Telephone: 0606 48511 Fax No: 0606 48512

The 'game' of *Life* is an old idea dating back long before the arrival of the micro. There have been many BBC micro *Life* programs but most suffer from either a restricted size or a sluggish performance. This program has a field size of 64x32 and its speed depends on the number of cells on the screen.

With 500 cells it manages about eight generations a second. Ten synchronised gliders – 50 cells – run at an amazing 24 generations per second. The average is typically around 15-16 generations a second.

What is the secret of this speed? The conventional approach to *Life* is slow because it has to check the eight neighbours of each cell, on the off-chance there may be three and a new cell be born.

This method is based on the observation that a cell which is dead in the current generation can have no effect on the next generation. Consider two arrays, one called 'cells' (holding the live/dead flags for each cell) and the other 'votes'.

First zero the votes array, then for each generation, scan the cells array. If a live cell is found it 'casts a vote' for each of its neighbours by incrementing the appropriate locations in the votes array. Like a good politician it also votes for itself.

When all the cells have been polled scan the votes array. If a cell polls no votes it was dead and remains dead.

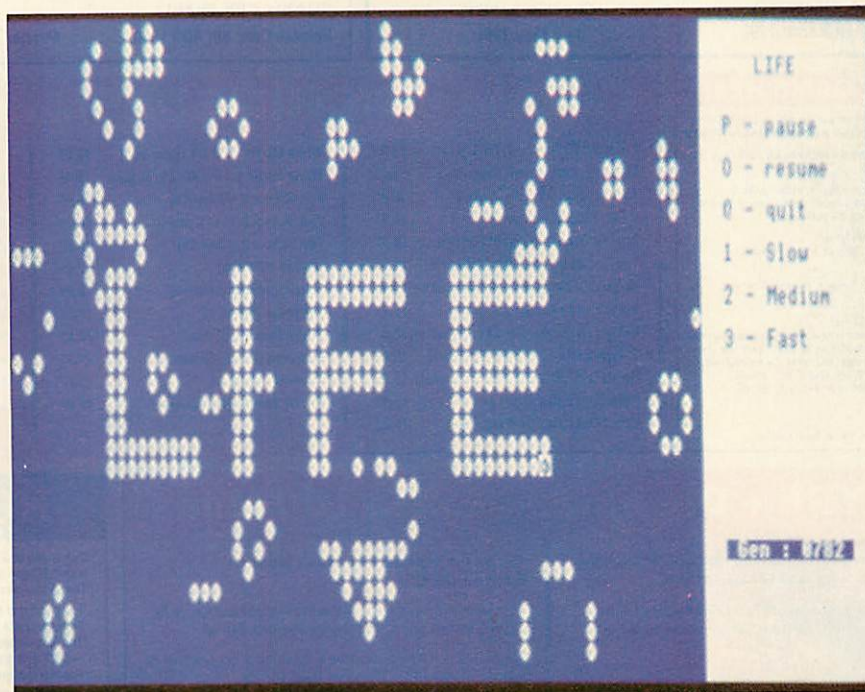
If a cell polls four votes it is either a live cell with three neighbours or a dead cell with four neighbours. In either case it remains unchanged, so clear its vote and skip it. If a cell polls three votes it is either a live cell with two neighbours or a dead cell with three neighbours, so zero its vote and if not already alive, mark as live and print it. In all other cases the cell must die so clear its vote and if not already dead mark as dead and delete it.

A bit of thought shows this is merely a restatement of Conway's rules incorporating the cell itself. The speed depends largely on the number of cells which change state.

The size of the field, 64x32, is not only convenient for display but means the two arrays are exactly 2K in size, making it easy to move between them. It also allows wraparound to be simply achieved by means of a bitwise AND – a speedy machine code alternative to Basic's MOD function. Specifically, where $N\%$ is a power of 2 (4,8,16...), $X\% \text{ MOD } N\%$ can be replaced by $X\% \text{ AND } (N\%-1)$, which is much faster.

Life time

So much for theory. First enter and run listing 1. This assembles and saves the machine code, which occupies most of pages &9 and &A – used only for tape sequential files (OPENOUT, etc), *SPOOL and *EXEC.



An old chestnut gets a new lease of life with a Beeb version from **PHIL BENDER** that's fast enough to make even the Archimedes sit up and take notice

BORN AGAIN

Next enter listing 2, the Basic control program. This sets up various variables, including a screen address lookup table in page &C but it is mainly concerned with editing the initial generation.

Most options are catered for but feel free to design your own cells – the last seven DATA items.

Having entered the program, it's time to test it. Enter a line of five cells.

Move down a row, and put one cell under the left-hand end. Move down another row, and put one under the right-hand end, and press RETURN.

This starting pattern sends colonies of cells swirling round the screen, emitting several gliders, until it reaches a stable con-

figuration some 1200 generations later – less than 70 seconds in fast mode. Another ploy is to see how long a random start pattern will remain active.

My record is about 3100 generations (in a little over three minutes).

You could write a routine to save and load the start patterns. The easiest way would be to save the entire memory between HIMEM and &8000.

As a final thought, a native Arm code version of this algorithm should comfortably outrun the display!

For more details on this *Life* algorithm, see 'Life in the Fast Pool' by Steve Broderick in the August 1988 issue of *Program Now*.

GRAB A BARGAIN!

Come and meet us in person at these terrific Micro Shows.
See the NEW RELEASES and try them out for yourself.

COMPUTER CASH & CARRY

Stands 13 & 14
GMEX, Manchester
15 - 18 March 1990

THE SPRING COMPUTER SHOW

National Hall,
Olympia, London
4 - 6 May 1990

FREE GAME HELP

Spend over £40 on games and you may choose ONE of the following helpsheet/solutions and maps absolutely FREE!!

Spend over £100 and you may choose any TWO FREE!! :-

HELPSHEET For:-
Elite 2, Zarch, Elite, Paperboy, Soy vs Spy,
Hoverbowl, Frak, Impact Jokes 1, Impact Jokes 2, Skirmish,
Anarchy Zone, Impact, Starquake.

HELPSHEET + MAP(S) For:-
Pipeline, Kourtyard, Dunjunt, Icarus, Repton 2.

SOLUTION For:-
Meyren, Corruption, Enthar 7, Tenamex, The Hobbit,
Kaylen, The Hunt.

SOLUTION + MAP(S) For:-
Spycat, Plan B, Anwolf, Imogen, Quest, Ravenskill Golden
Furniture, Elite 3, Citadel, Plan B2, Elite, Spellbinder, Twin
Kingdom Valley, Omega Orb, Tarzan, Codename Droid,
Thunderstruck 1 or 2, Last Ninja, Palace of Magic,
Gibbunes Castle, Sphinx Adventure Stormcycle,
Lost Crystal.

MAP(S) For:-
Shark, Strykers Run, Thrust, Bonecruncher.

FREEDOM FIGHTER

Incredibly realistic combat action with the best (and the most) graphics and music yet seen on the Archimedes.

Produced by Peter Gillett, the author of the highly acclaimed Arcade Soccer, the game pitches you against horrendous odds. Using machine guns, rocket launchers and other weaponry you must blast the enemy troops, tanks and aircraft into oblivion to achieve your objective. Incredibly action packed

Release Date: 6th April 1990

Price Below

APOLYPSSE

Produced by Gordon Key the author of Holed Out and E-Type, this incredible new Archimedes game sets new standards of excellence in 3-dimensional solid graphics and digitised sound effects. Your overall task is to rescue a whole solar system from an evil dictatorship. Apocalypse is a feast for your eyes, ears and grey matter.

Price Below

★★★★★

ARCHIMEDES/A3000 GAMES

★★★★★

Freedom Fighter (4th Dimension)	24.95*
Man - At - Arms (4th Dimension)	19.95*
Apocalypse (The 4th Dimension)	29.95
U.I.M. (The 4th Dimension)	29.95
Arcade Soccer (The 4th Dimension)	19.95
The Olympics (The 4th Dimension)	19.95
Holed Out Designer (4th Dimension)	19.95
E-Type (The 4th Dimension)	19.95
E-Type Designer (The 4th Dimension)	16.95
E-Type Extra 100 Miles (4th Dim'n)	16.95
Holed Out (3D Golf) (4th Dimension)	19.95
Holed Out Extra Courses Vol 1	16.95
Holed Out Extra Courses Vol 2	16.95

White Magic (The 4th Dimension)	19.95
White Magic 2 (The 4th Dimension)	19.95
Fun School 2 (Under 6's)	16.95
Fun School 2 (6 to 8 years)	16.95
Fun School 2 (Over 8's)	16.95
Casino (Minerva)	17.95
Maddingly Hall (Minerva)	12.95
Talisman (Minerva)	12.95
Trivial Pursuit (Domark)	25.95
Fugitives Quest (Robico)	25.95
Caverns (Minerva)	15.95
Family Favourites (Minerva)	16.95

Quazer (Impact Software)	11.95
Interdictor (Clares)	2.95
Startrader (Gem)	1.65
Return to Doom (Topologika)	18.95
Avon & Murdad (Topologika)	18.95
Acheton (Topologika)	18.95
Enthar 7 (Robico)	25.95
Word Up & Word Down (Gem)	16.95
Pacmania (Grandslam)	15.95
Jet Fighter (Minerva)	11.95
Fireball (Godax)	15.95
Orion (Minerva)	11.95

Rise In Crime (Robico)	25.95
All in Boxing (Alien Images)	12.95
Giant Killer (Topologika)	18.95
Freddy's Folly (Minerva)	11.95
Alerion (Dabs Press)	12.95
Terramex (Grandslam)	15.95
Hoverbowl (Minerva)	11.95
Missile Control (Minerva)	11.95
Thundermonk (Minerva)	11.95
Minotaur (Minerva)	11.95
Ibix The Viking (Minerva)	16.95
Cheat It Again Archie (Impact)	11.95

*Due for release 6th April 1990. All the above games will work on Archimedes A3000, 310 and 400 series.

E-TYPE + Designer + Extra 100 Miles

Exceptional playability and incredible video digitised cars make this the best car racing game we have ever seen.

Your opponents include beautifully detailed Porches, Lotuses, Audi Quattros etc. etc. (BBC and Electron versions are due for release in early May).

"On the Archimedes the illusion of speed is terrifyingly real and the way the landscape moves in three-dimensional perspective is a joy - a stunning experience. ... The Independent Dec '89

"This is a superb game ... the tracks are fantastic." ... The Times, Dec '89

"For challenging races with a real sense of speed and fun, go for E-Type's ignition key." ... The Games Machine, Feb '90

"There's just one word to describe E-Type: Fantastic. Graphics 10, Value for Money 10." ... The Micro User, Dec '89

"The graphics in E-Type are really superb. E-Type in my opinion is probably the best game yet for the Arc." ... Risc User, Dec '89

HOLED OUT - 3D GOLF

Due to overwhelming public demand The 4th Dimension has now produced 2 volumes of extra courses for their superb 3D golf game Holed Out. Each volume contains 2 superbly designed brand new courses. These courses are a lot trickier than the 2 courses which are on the original Holed Out!

"I play golf and this game is the closest thing I've seen to the real game on a computer." Archive, June '89

"I wouldn't have thought it possible to get a better simulation out of the boob." B BC Acorn User, June '89.

"The 3D perspective graphics are stunning." Electron User GOLDEN GAME June '89

"Holed Out is great! The game plays very well and the graphics are superb."

Popular Computing Weekly, March 1989

"The best golf simulation I've ever seen on any Acorn machine." The Micro User, June '89

"The Electron version is brilliant - it's almost the same as playing at Gleneagles. Unreservedly recommended."

A & B Computing Game of the Month, June '89

Prices above and opposite

TITLE & PUBLISHER	BBC or Electron Cassette	BBC or Electron Disc	Master Compact 5 1/4" Disc	TITLE & PUBLISHER	BBC or Electron Cassette	BBC or Electron Disc	Master Compact 5 1/4" Disc	TITLE & PUBLISHER	BBC or Electron Cassette	BBC or Electron Disc	Master Compact 5 1/4" Disc
M = Master Compatible				M = Master Compatible				M = Master Compatible			
IMPACT SOFTWARE (Discs are BBC B & Master Compatible 400k)				ARVYARK Ziaaga (Elec Only)	4.95	-	-	IMAGINE Wizard (BBC B Only)	4.95	-	-
The Art of M	9.95	12.95	-	ASL Blast M	7.95	10.95	-	INCENTIVE Moon Cretia (BBC Only)	-	4.99	-
Orbit M	4.95	5.95	6.95	Powerpack 2 (Elec Only)	5.95	-	-	LEASURE GENIUS Monopoly	-	9.95	-
Cloggy M	4.95	4.99	6.95	Thunderstruck	4.95	-	-	MANDARIN Lancetol (80 Track Only BBC B)	-	-	11.95
Zaron M	4.95	4.99	6.95	Computer Hits 1 (10 games) (Elec Only)	-	9.50	-	with sideways RAM, Dr. Master M	-	-	9.95
Cheat It Again, Joe 1	2.99	4.99	-	Computer Hits 5 (5 games)	-	5.95	-				
Cheat It Again, Joe 2	2.99	4.99	-								
Cheat It Again, Joe 3	2.99	4.99	-								
ELITE Paperboy M	2.99	11.95	-								
THE FOURTH DIMENSION				BUGBYTE Bugbyte Comp 2 (4 games)	-	4.99	-	MARTECH War (BBC Only)	-	3.99	-
E-Type (Release 7th May) M	9.95	14.95	15.95								
Evrika (Release 7th May) M	9.95	12.95	13.95								
Newton M	-	-	14.95								
U.I.M. (Disc only BBC B or B+ with sideways RAM and Master Series M)	-	-	-								
Holed Out (3D Golf) M	9.95	11.95	12.95								
Holed Out Extra Courses Vol 1 M	9.95	11.95	12.95								
Holed Out Extra Courses Vol 2 M	9.95	11.95	12.95								
White Magic M	9.95	12.95	13.95								
Arcade Soccer M	9.95	12.95	13.95								
SUPERIOR											
Infinity M	8.95	-	-								
Play It Again Sam 3 M	6.95	8.90	-								
Play It Again Sam 4 M	6.95	-	9.95								
Play It Again Sam 5 (BBC Only) M	6.95	9.50	-								
Play It Again Sam 6 (BBC Only) M	6.95	-	-								
Play It Again Sam 10 (BBC Only) M	6.95	-	-								
Predator (BBC Only) M	6.95	-	-								
Pipeline M	4.95	6.95	-								
Repton Thrust Time M	4.95	-	-								
The Use of Repton M	4.95	-	-								
Eliza M	6.95	-	9.95								
Repton Around the World M (Elec Only)	4.95	-	-								
Acornsoft Hit 1 M (BBC Only)	3.99	-	11.50								
Spellbinder M	-	-	7.95								
TYNESOFT											
Sargon	-	9.95	-								
Riddle Games M	7.50	11.95	-								
Superman M	7.50	-	-								
Cruise Games M	6.90	-	-								
Summer Olympics M	6.90	11.25	11.25								
Indoor Sports M	7.50	11.95	-								
GOOAX											
Skirmish M	4.95	6.95	6.95								
Kourtyard M	5.95	6.95	6.95								
ACORNOSOFT											
Water (BBC Only)	3.99	-	-								
Revs & Rews 4 Tracks (BBC B Only)	3.99	-	-								

U.I.M. (ULTRA INTELLIGENT MACHINE) The Fourth Dimension

Possibly the most exciting BBC release for a long time. U.I.M. is a massive 3D vector graphic action adventure set in the future. The greenhouse effect has melted the icecaps and all life now exists in hundreds of colonies under the sea. You must travel the oceans, completing missions, trading in currencies, commodities and shares in search of the U.I.M. There are many types of ship you will encounter in your highly manoeuvrable futuristic submarine and you must develop your weaponry and equipment to deal with the challenges you will face. U.I.M. is disc only and will run on BBC B or B+ with sideways RAM and Master Series Computers. The fully enhanced Archimedes version is also now available.

"Will I keep playing it the way I've played Elite for years? And the answer is yes. Graphics 10, Playability 10, Value for Money 10" The Micro User, Nov '89.

Prices above and opposite

BUDGET TITLES

BBC B or Electron Cassettes

ALL ONLY £1.99 EACH

Anarchy Zone
Bar Billards
Percy Penguin
Peycasia
Round Ones
Smash and Grab
Snapper (Elec only)
Snooper (BBC only)
Soccer Boss
Starship Command (Elec only)
Steve Davis Snooker
Stormcycle
Slyt
Wet Zone (Elec only)
Grid Iron
Indoor Soccer (Elec only)
Last of the Free
Magic Mushrooms (BBC only)
Monkey Nuts
Mr Witz
Nuts (BBC only)

ALL ONLY £2.99 EACH

Frankenstein 2000
Golden Figurine
Golf
Graham Gooch Cricket (Elec only)
Grid Iron
Indoor Soccer (Elec only)
Last of the Free
Magic Mushrooms (BBC only)
Monkey Nuts
Mr Witz
Nuts (BBC only)

Croaker (Elec Only)
Dunjunt
Demolators
Elzar
Football Manager
Footballer of the Year
Frenzy (Elec only)
Gallathea
Green Beret (BBC Only)
Grid Iron 2
Hunkydory
Karate Combat
League Challenge
Megarock (BBC only)
Palace of Magic
Paperboy
Plan B
Plan B2
Pro Golf

IMPACT NEWSLINE

For the very latest news ring: 0898 654334

25p per minute cheap rate; 30p all other times (if you are using your parents phone please ask for their permission first)
Now updated every week, the newsline is a superb way of keeping up to date with the latest releases, games news, bargains and the top 5 best-selling games of the week.

SIMPLY FILL IN THIS COUPON AND SEND A CHEQUE OR POSTAL ORDER TO IMPACT SOFTWARE.

- All games despatched by 1st class post.
- FREE postage and packing (U.K. only).
- Overseas - add £2 per item.
- Despatch normally same day as order.
- Minimum orders £3.00.
- Telephone orders welcome.

TELEPHONE ORDERS WELCOME
24 HOUR SERVICE 7 DAYS A WEEK



VISA

IMPACT
Software

(0742) 769950
Impact Software
Neepsend House
1 Percy St
Sheffield S3 8AU

To: Impact Software, Neepsend House, 1 Percy St, Sheffield, S3 8AU. Please send me the following :-

TITLE **FORMAT** **COMPUTER** **PRICE**
(Cassette etc.)

(We cannot accept orders for less than £3.00)

* I enclose a cheque/P.O. or :

* Debit my Access/Visa card account :

TOTAL COST.....

£

(BLOCK CAPITALS PLEASE)

Name.....

Address.....

Postcode.....

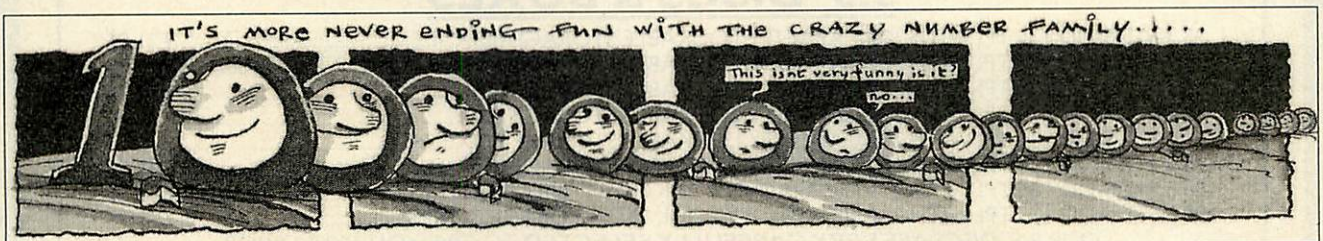
Please send me FREE helpsheet/solutions/maps for the following games (from those above)

1 (Orders over £4)

2 (Orders over £10)

When your computer can't manage any better than an old-fashioned handheld calculator, then you need to investigate this face-saving utility from **DAVID COOK**

PRECISION



It is a frustrating fact that the BBC micro can only calculate on a limited number size, less in fact than most scientific calculators. This machine code arithmetic routine allows integer arithmetic to be performed on numbers up to 4095 digits long with absolute accuracy.

The commands are quite easy and correspond to those found on simple calculators but have been implemented as extra operating system commands (star commands) so they can be used within a Basic program.

The ability to use large numbers can be useful in many mathematical problems. Also the use of large whole numbers is becoming increasingly important in computer confidentiality as some codes involve the use of large prime numbers (such as the Rivest-Shamir-Adelman system) which make code breaking extremely time consuming and so effectively impossible.

Although only dealing with integer numbers, it is possible to use this routine to calculate real numbers (those with decimal fractions) provided the position of the decimal point can be determined by the control program. This is shown in the demonstration program which can calculate the square root of a number accurate to better than 2000 decimal places.

The routines are slow compared to the usual Basic arithmetic, despite being written in machine code, and complex calculations or repetitive loops involving large numbers can take many minutes or even hours to perform.

This is especially true of division which should be done as little as possible if maximum speed is wanted. The only exception to this is the separate command to divide the accumulator by 100 (*DAH) which is fast so it is much faster to multiply by 50 and divide by a hundred using *DAH than to divide by 2.

MADE

Dividing a 2000 digit number (9999999...9) by two takes over 10 minutes but multiplying by 50 and dividing by a hundred takes about a quarter of a second.

The program uses storage registers located from &1900 onwards.

This area is normally the start of Basic memory so the program requires PAGE to be reset to 18K (PAGE=18*1024) before loading and running the program.

A test is included to prevent the program overwriting itself.

Once installed the routines are very easy to use and can be accessed either in immediate or program modes.

The routines use several registers but only three need be considered by the programmer. The first of these is called A for accumulator. This holds one of the starting numbers of any routine and always holds the result of the calculation. It is located from &1900 to &28FF.

The second register (located from &2900 to &30FF) is called the X register and this holds the second starting number in any calculation but is unaltered at the end of the routine.

The third register (located from &3900 to &40FF) is called the Temporary, or T, register. This is used by several routines.

It is used by the division routine to hold the remainder after integer division, to pass numbers from Basic to the multiprecision A register and also during multiplication.

Each register has a set of pointers associated with it which indicates the size of the number. The index for the A register is a 2-

byte number held at &72,&73 and this gives the length in bytes of the number in the A register. Each byte contains two digits so the length of the number is twice this length. The easiest way to read the number of digits is $(?&72+?&73)*2$.

The X register pointer is held at &76,&77 and the T register pointer at &7E,&7F.

All the instructions can be used in either direct mode or within a Basic program.

The only limitation is that each command must be the only command on a line as with other star commands.

The two registers, A and X, are called such to follow the pattern of 6502 assembler code. The result of any calculation is left in the accumulator and the X register is not changed.

All calculations are in positive integer arithmetic and there is no provision for decimal points.

The routines can be used to calculate decimals but the programmer must keep a check on the position of the decimal point. The new instructions can be of three types.

Ins and outs

Input and output commands allow input and output of the contents of the registers either from keyboard, disc or program.

*KBI allows direct input from the keyboard into the A register. Any number of digits up to 4095 can be entered. Entry is terminated as usual by a RETURN.

*PRA prints the contents of the A register to the screen and printer etc if active.

*SAVE is the normal operating system

PUBLIC APOLOGY

M. D. Office supplies would like to take this opportunity to apologise to all its competitors. As always we will supply the highest standard Discs, Storage Boxes, etc. at the lowest possible prices. **IN FACT WE GUARANTEE IT.**

JUST LOOK AT THESE PHENOMINAL OFFERS

3.5" DISCS & BOXES

25 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£21.95
35 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£29.95
45 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£34.95
55 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£39.95
65 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£44.95
75 3.5" DS-DD 135 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£49.95
150 3.5" DS-DD 135 TPI WITH 2, 100 CAPACITY LOCKABLE STORAGE BOXES.....	£89.95
200 3.5" DS-DD 135 TPI WITH 2, 100 CAPACITY LOCKABLE STORAGE BOXES.....	£99.95

OUR 3.5" DISCS ARE **VERY CAREFULLY SELECTED** TO GIVE YOU 100% ERROR FREE PERFORMANCE, EACH DISC IS OFFERED WITH OUR 100% MONEY BACK GUARANTEE AND IS SUPPLIED WITH LABELS

5.25" DISCS & BOXES

25 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£12.50
50 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£16.50
75 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£22.50
100 5.25" DS-DD 96 TPI WITH 100 CAPACITY LOCKABLE STORAGE BOX.....	£28.50
200 5.25" DS-DD 96 TPI WITH 2, 100 CAPACITY LOCKABLE STORAGE BOXES.....	£52.99

OUR 5.25" DISCS ARE **VERY CAREFULLY SELECTED** TO GIVE YOU 100% ERROR FREE PERFORMANCE, EACH DISC IS OFFERED WITH OUR 100% MONEY BACK GUARANTEE AND IS SUPPLIED WITH LABELS

HIGH DENSITY 3.5" DISCS

10 DS-HD 3.5" DISCS.....	£14.99
30 DS-HD 3.5" DISCS WITH 50 CAPACITY BOX.....	£49.99
50 DS-HD 3.5" DISCS WITH 100 CAPACITY BOX.....	£64.99
100 DS-HD 3.5" DISCS WITH 100 CAPACITY BOX.....	£110.00
150 DS-HD 3.5" DISCS WITH 100 CAPACITY BOX.....	£149.95

HIGH DENSITY 5.25" DISCS

25 5.25" DS HD 1.6 Mb plus 50 BOX.....	£16.99
50 5.25" DS HD 1.6 Mb plus 100 BOX.....	£34.99
75 5.25" DS HD 1.6 Mb plus 100 BOX.....	£47.99
100 5.25" DS HD 1.6 Mb plus 100 BOX.....	£59.99
150 5.25" DS HD 1.6 Mb plus 2, 100 BOX.....	£79.99
200 5.25" DS HD 1.6 Mb plus 2, 100 BOX.....	£99.99

BULK BUYERS – BULK BUYERS – BULK BUYERS

For all you large users we have some excellent bulk rates on our superb diskettes

250 DS-DD 135 TPI.....	£120.00	600 DS-DD 135 TPI.....	£258.00
350 DS-DD 135 TPI.....	£160.00	750 DS-DD 135 TPI.....	£315.00
500 DS-DD 135 TPI.....	£220.00	1000 DS-DD 135 TPI.....	£395.00

As always Lifetime Guaranteed and 100% reliability

NEW EXCITING PRODUCTS

3.5 80 Capacity Stackable Box.....	£9.95
5.25 180 Capacity Stackable Box.....	£19.95
3.5 Atari External Drive.....	£79.95
Universal Printer, Stands.....	£6.95
2-way Manual Data Switch available as RS232 or	
Centronics (please state).....	£12.95
Atari Printer Leads.....	£5.95
Pneumatic Monitor Arm	
(ultra smooth operation 25Kg load).....	£49.95

PRICE & QUALITY GUARANTEE

We pride ourselves on offering you the very Highest Quality products at the best possible prices. If you should ever see a comparable product offered cheaper in this magazine DO NOT HESITATE give us a call because we won't match it.

WE WILL BEAT IT – GUARANTEED



Trade Accounts Welcome

M. D. OFFICE SUPPLIES

18 CRESCENT WAY, FARNBOROUGH, KENT BR6 9LS

TELESALES HOTLINES: 0689-61400

All prices include VAT and Delivery UK only. E/OE



Education Orders Welcome

command and has its usual syntax. If used with the appropriate addresses it will save the A or X registers. So, *SAVE <name> 1900 28FF saves the A register and *SAVE <name> 2900 30FF saves the X register. *LOAD is also the usual star command and reloads the appropriate register as above. Remember that these commands are operating system commands and cannot use variable names so if A\$="FILE" then *LOAD A\$ will only load a file named A\$ and will not load FILE.

After loading, the pointers indicating the size of the number held must be reset using *RSX or *RSA as appropriate.

*STR allows a string of digits to be directly entered in Ascii decimal format. The numbers are poked directly into memory starting at &3900.

The string of numbers is terminated with a carriage return and then *STR is used to convert it into a number in the A register.

Up to 2047 digits can be entered in this way. It uses the same routine as keyboard entry but allows numbers to be calculated in Basic and transferred to the A register. For example:

```
10 a=10*24+7
20 REM convert to Ascii
30 a$=str$(a)
40 FOR J= 1 TO LEN(a$)
50 REM inserts into Ram one
  digit at a time
60 ? (J+&3900)=ASC (MID$(a$,J,1))
70 NEXT J
80 ? (J+&3900)=13
90 *STR
```

Memory tricks

The memory transfer commands rearrange the contents of the registers as follows:

*TAX transfers the contents of A into X. The previous contents of X are lost but the contents of A remain unchanged.

*TXA transfers the contents of X into A. The previous contents of A are lost but the contents of X remain unchanged.

*EXA switches the contents of the A and X registers without losing any data.

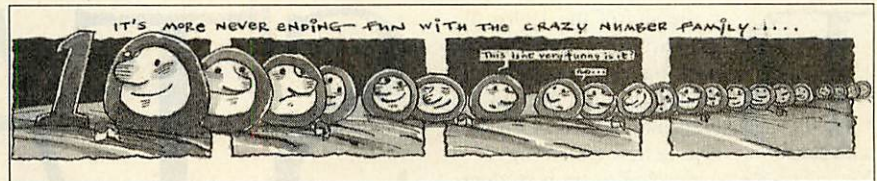
*ETA switches the contents of the A register and Temporary register holding the remainder after division.

*CLA clears the A register, while *CLX clears the X register. Registers should be cleared before loading.

*RSA resets the pointers for the A register. These indicate the number of digits held in the register and are used by the routines. The pointers must be updated after a LOAD and can be updated at any other time without harming the data in the register contents. *RSX resets the pointers for the X register.

Adding it all up

*ADD adds the contents of the X register to the A register and leaves the result in A. The contents of X are unaffected. *SUB



subtracts the contents of the X register from the A register and leaves the result in A. The contents of X are unaffected.

*MXA multiplies the contents of the X register by the A register and leaves the result in A. The contents of X are unaffected.

*DXA divides the A register by the X register. The result of the integer division is left in the A register and any remainder is in the T (temporary) register and can be retrieved with *ETA.

No test is made for division by zero. If this occurs, the routine locks up and possibly destroys data and even the program.

*MAT multiplies the A register by 10 without affecting the X register which need not contain 10.

*DAH divides the A register by 100 without using the X register.

*CMP compares the X and A registers and stores the result in &8D and the result can be recovered using ?&8D. If A is more than X then &8D will return 1, if A equals X then &8D will return 0 and if A is less than X, &8D will return 255.

```
0141421356237309504880168872420969807856967
1875376948073176679737990732478462107038850
3875343276415727350138462309122970249248360
5585073721264412149709993583141322266592750
5592755799950501152782060571470109559971605
9702745345968620147285174186408891986095523
2923048430871432145083976260362799525140798
9687253396546331808829640620615258352395054
7457502877599617298355752203375318570113543
7460340849884716038689997069900481503054402
7790316454247823068492936918621580578463111
5966687130130156185689872372352885092648612
4949771542183342042856860601468247207714358
5487415565706967765372022648544701585880162
075847492265722600208584466521458398893944
3709265918003113882464681570826301005948587
040031864803421948972782906410450763688131
3739855256117322040245091227700226941127573
6272804957381089675040183698683684507257993
6472906076299694138047565482372899718032680
2474260629269124859052181004459842150591120
2494413417285314781058036033710773091828693
147101711168391658172688941975871658215212
8229518488472089694363862891562882765952635
1405422676532396946175112916024087155101351
5045538128756005263146801712740265396947024
0300517495318862925631385188163478001569369
1768818523786840522878376293892143006558695
6868596459515550164472450983689603688732311
4389415576651040883914292338113206052433629
4853170499157717562285497414389991880217624
3096520656421182731672625753959471725593463
7238632261482742622208671155839599926521176
2526989175409881593486400834570851814722318
142040704265090565323339843645786579679651
9267292399875366617215982578860263363617827
4959942194037777536814262177387991945513972
3127406689832998989538672882285637869774966
251996583525776198939322845344735694794962
9521688914854925389047558288345260965240965
428893453864662574492755638196441031697983
306185201937398494005715633372054080540575
8679996701213722394758214263065851322174088
3238294728761739364746783743196000159218880
734785761725221186749042497736929207311096
3697216089337086611567345853348332952546758
5164471075784860246360083444911481858765555
4286455123314219926311332
```

Figures showing the square root of two – as produced by the example program

Using the program

As well as the multiprecision program itself, an example program is also included in the yellow pages.

This illustrates the use of the new commands with a calculation of the square root of 2 using Newton's algorithm.

This involves a decimal but since the approximate result is known (about 1.4) the integer routines can be used.

The algorithm is:

So, in Basic the program could read:

```
NEW APPROX=0.5*(APPROX+(NUMBER/2))
```

Using the multiprecision routines needs

```
10 B=1
20 REPEAT
30 A=B
40 B=(A+A/2)/2
50 UNTIL A=B
60 PRINT B
70 END
```

more program lines as composite equations must be broken down to single steps as with a calculator. The variables are stored on disc. Since we can't use decimals, we actually calculate the square root of 2×10^{4088} .

The first approximation of the root is 1×10^{2044} . Although the number 1×10^{2044} can be entered directly (lines 100-130) the number 2×10^{4088} must be calculated by entering 2×10^{2044} and then multiplying by 1×10^{2044} .

Instead of dividing by 2 the number is first multiplied by 50 and then divided by 100 as this is much quicker. However, the program still runs slowly! It takes about a dozen lengthy iterations.

It does however eventually calculate the square root accurate to 2043 decimal places (the last digit is inaccurate it should be 3 not 2).

The program uses BCD (Binary Coded Decimal) arithmetic.

This is not often used in programs as it is wasteful of memory. Each byte of memory stores two decimal digits so a single byte can only store numbers from 0-99 instead of 0-255 in binary.

Each digit is stored in its half byte (or nibble) in normal binary form but the bit patterns 1010, 1011, 1100, 1101, 1110 and 1111 are not used in BCD (these correspond to A-F in hex).

If you wish to use the BCD directly then you must take care that these particular bit patterns do not get introduced or errors may creep in.

By the end of the 1990s the educational environment will have changed completely, due not only to the National Curriculum but also to new technology.

Yet schools are expected to train students to cope with new technology using ad hoc systems left over from the experimental days of the middle and late 1980s.

One should not underestimate the importance of those days because this was when many people discovered, studied and exploited the power of IT in the classroom: when resources, although never enough, were placed in the hands of potential users.

This situation really was ad hoc, simply because it was led by the technology and not by the curriculum. The question always asked was 'What can we do with this in the classroom?'

Generally speaking we now know what we can do with this or that in a curriculum context and the question has become much more refined: 'With which software shall we do this most appropriately and on which machine?'

We are now experiencing a buyers' market and the results of this are currently being seen, especially in the context of local management of schools (LMS) which means that each school is to receive control of its own budget.

You will probably have noticed that both hardware and software producers are radically altering their strategies in order to redirect their efforts at individual schools, rather than at the computer centre advisers who have, against all the odds, borne the administrative brunt of testing, evaluating and licensing software for their regions.

The advisory service system has worked well and had major benefits for schools so there will inevitably be a period of adjustment while schools learn to flex their new-found financial muscle.

Primary school needs

So with all this freedom of choice, what should primary schools be standardising on over the next few years?

Well, they will need a computer which will do a wide variety of tasks, powerfully and prettily, complete with a good body of software and few user problems.

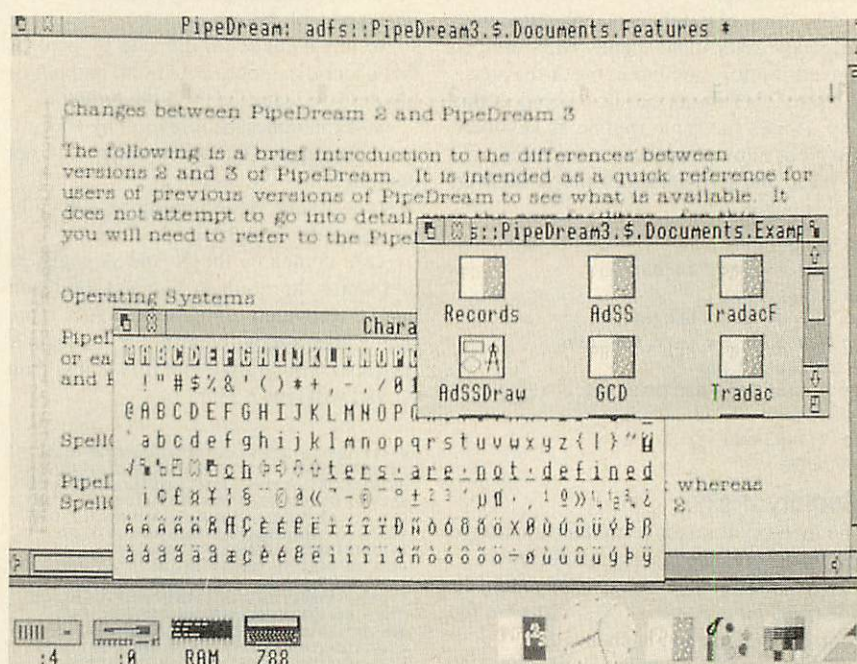
The Archimedes certainly fits this description. There is no other logical choice for a primary machine and the BBC A3000 is likely to become a standard in most authorities.

A minimum target must be one machine per classroom. One computer centre manager has said he feels that introducing extra single machines into that environment actually causes more problems than benefits.

Therefore, the next logical step must be to upgrade 'per class' each time. However,

STAR GAZING

CHRIS DRAGE and NICK EVANS cast their eyes heavenwards and consult the skies on the future of IT in schools



the financial logistics of this are beyond most primaries and it can only happen with national or local government support.

Yet in order to fulfil the National Curriculum it is particularly vital to increase levels of IT provision in primaries. Without it the degree of integration of IT into the

curriculum and therefore the ability to achieve IT Attainment Targets will be reduced. There is still a battle to be fought, not just at primary level, with teachers who, through no fault of their own, have not yet acquired the skills of new technology.

Some of those who have just begun to come to terms with the BBC B and Master have suddenly had them snatched away and an Archimedes put in their place.

It's easy for those familiar with the Arc's user interface to assume that there is a minimal learning curve – that only comes after you've mastered three mouse buttons, indeed, the mouse itself, and worked out what all the spots, sliders and corners mean on the screen windows.

When the initial reaction is 'It looks a bit complex', it's difficult to get across that in fact it's ultimately much easier. So, as well as the kit, primary schools need basic training for many teachers.

Secondary school needs

The picture is different in secondaries, simply because the schools work differently.

Secondary schools are also going to be looking for a versatile machine. The Arc needs to be an artist, an information-handler, a document-processor and everything else but it's one of the few machines that can do all this well at all levels.

As the software base grows, so the need for equipment is going to grow. Schools will need a mix of provision: free-standing machines for individual use; computer rooms for groups; terminals in libraries and resource centres; workstations for graphic design, control technology and other design and technology tasks; MIDI interfaces and the power of the Arc to sample and synthesise sound in music departments.

Yes, but all that we know. What about the rest? There are significant issues relating to the ancillary equipment which complements the activities performed on the computer. Printers are a case in point.

The advent of 24-pin printers has left many people feeling dissatisfied with the old nine-pin variety. Quality and speed improvements mean more pupils can get to the system.

In addition, colour printing is a major issue. The debate about ink-jet versus colour ribbon never really got off the ground – you've only to look to see the difference. Therefore, the Integrex printer has become something of a standard. However, new machines like the Citizen Swift 24-pin printer with colour option comes in at under £300. It does everything you could want to a high quality and with the option to drive colour printing when necessary.

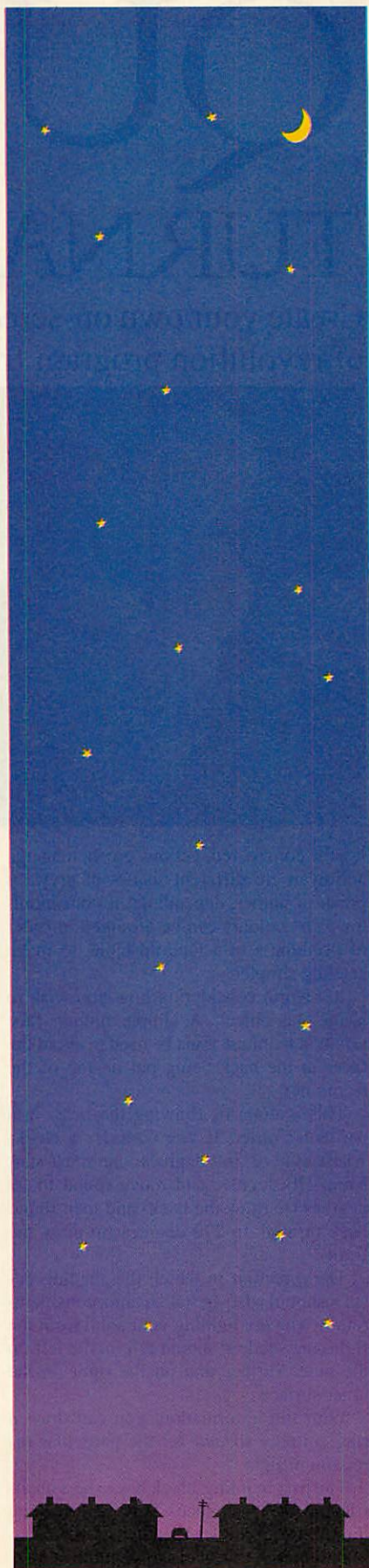
And then of course there is the laser printer. They used to cost around £6000 each but bottom of the range ones with limited fonts and no Postscript can come in under £1000.

Desktop publishing activities really demand that quality of output but how do you make sensible use of one laser printer in a comprehensive? Well, that's where your network comes in. Sharing that sort of resource for final print activities is a significant boon and when considered in the context of a school with, say, 20 Arcs, doesn't amount to a significant 'per machine' cost.

What other peripherals are going to be on the scene at the end of the decade? Certainly CD-Rom will be a main player.

It's relatively cheap, powerful, and discs can hold not just data but text, graphics, sound and even video.

The capability for schools and authorities to create their own CDs is not far away. Dedicated local authority historical study discs, geographical surveys of topography, demography and other features all inter-related with interactive OS maps and the capacity to update one's own findings opens



up whole new worlds for learning and research. What about the software? Whereas schools, both primary and secondary, have traditionally gone for as much software as possible, covering topics as diverse as canal-building and drug abuse, the tendency is definitely away from large volumes of computer-aided learning (CAL).

This has been reinforced by the National Curriculum. There is still some room for the software which maps directly or partly on to those areas being exploited by teachers, and in a few years' time when the hiatus has passed, it seems likely that CAL will rise again.

Now, schools are after only one type of software – generic productivity tools.

The powerful multi-purpose product like *Pipedream* (Colton) was seen by some a year ago to be out of range of schools' budgets. *Pipedream* is now selling well into schools, despite its £100 price tag. Power, ease of use and quality are valuable commodities and, like all consumers, schools are willing to pay for them.

The end result of this, however, is that the number of software packages schools feel are necessary has diminished radically, both by choice and financial necessity. Specialised applications are still attracting attention but the main applications are being licensed by schools nationwide. This trend is likely to grow.

The interlude in which primary schools in particular are trying to run BBC Master software on their Arcs will pass fairly rapidly. Unfortunately, it is not sufficient to say, 'You should run eight-bit software on an eight-bit machine'. If you have no funds, or the software you want has not been completed, then what else can you do with the new machine?

In the next 12 months or so, primaries will find there is a wide selection of dedicated software available, and the major tools for them will come on stream, just as they did for the Beeb and Master.

So, with schools networked in order to share peripherals and data, laser printed output from all stations and CD-Rom libraries available at the touch of a button, what changes are likely to take place in the actual setup of the use of computers?

Will the Arc remain a standard? Many observers feel that the world is moving towards a uniform user-interface environment which will become a standard for many years. It is seen in part in Risc OS, in MS-Windows and in the Macintosh.

Acorn and others believe that this point on the horizon is Unix teamed with a windowing environment which gives users easy access to even more power.

Prospects are good and schools yet again are in an era of technological change. Anyone who thinks they will ever be in anything else has not read the stars correctly!

Illustration by Rob Miller

If you remember Robert Robinson's weekly TV general knowledge quiz, *Ask The Family*, in which the Smiths would battle it out against the Jones to recognise oddly angled photographs, then you may remember the face-shaped vase at the start of the programme.

But what's this got to do with solids of rotation and what is one anyway? Imagine a potter at a wheel with a lump of clay. Suppose he was to take a pre-cut edge and use it to shape the clay while the wheel was turning. That pot is a solid of rotation.

Emulating the action of shaping a pot is quite simple on a computer. With a bit of maths, you can generate goblets, vases and bowls to your hearts content. There's also the added bonus of keeping your hands clean and, of course, no chance of your masterpiece flying off the wheel at the crucial moment.

Building blocks

A cylinder is used as the starting point and is best described as two equally sized ellipses and a series of straight lines. An ellipse can be drawn using a loop from 0 to 360 (or 0 to 2π if you were to use radians). Each point on the ellipse is defined as:

```
x=SINRAD(degree)*width
y=COSRAD(degree)*height
```

where degree is the loop variable and width and height are the respective width and height of the ellipse.

The following lines will draw an ellipse of any size at the position defined by centrex and centrey:

```
10 MODE 4
20 centrex=640:centrey=512
30 ewidth=200:height=100
40 VDU 29,centrex,centrey;
45 MOVE 0,height
50 :
60 FOR degree=0 TO 360
70 x=SINRAD(degree)*ewidth
80 y=COSRAD(degree)*height
90 DRAW x,y
100 NEXT degree
```

A cylinder can be formed by changing the following program lines:

```
60 FOR degree=0 TO 360 STEP 30
70 MOVE x,y : DRAW x,y+400
```

The loop at line 60 has been changed to step in jumps of 30. This divides the cylinder into 12 'sides'. The top and bottom of the cylinder have been omitted, although these won't be necessary when the sides are drawn in solid.

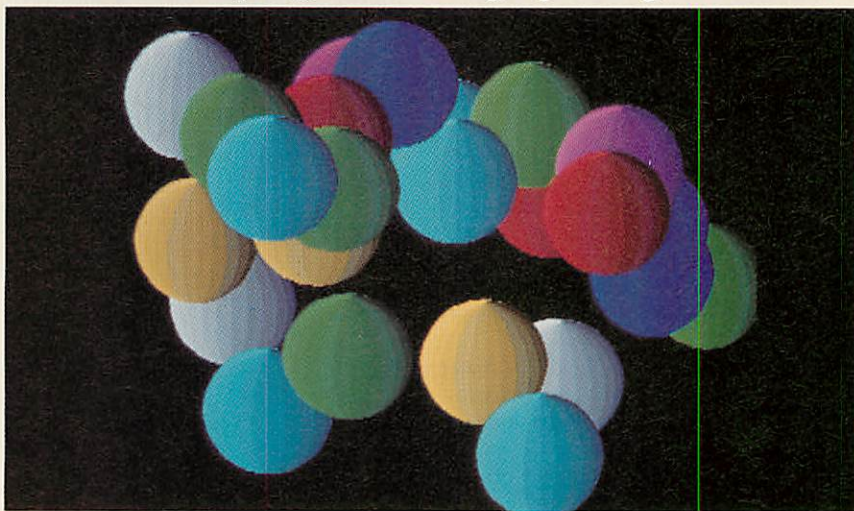
What you have at the moment is just a wireframe outline of a cylinder. By filling in the faces with different colours, a more solid look can be obtained.

A shaded scale, for example black to white, gives a good effect. This is simple with the Arc, as it's just a case of selecting the shades from the palette.

With the Beeb, you must cheat a little by using a monochrome monitor and assum-

QUICK TURNAROUND

Create your own on-screen still life with this solids of revolution program from graphics guru **ROB MILLER**



ing the colours red, yellow, green, magenta and cyan are different shades of grey (or green or amber, depending on your monitor). The colours can be arranged in order of brightness in a look-up table, to make shading simpler.

It's worth considering how you wish to shade the object. A simple hidden face removal technique must be used to avoid the faces at the back being put on top of the front ones.

This is done by drawing the faces in a particular order. If you consider a clockwise circle of 360 degrees, one must start from 270 degrees and move round to 90 degrees (to draw the back) and then round back through to 270 degrees (to draw the front).

The direction in which the shading occurs should also be taken into consideration. If you are lighting your solid from the right, the shadow should fall on the left on the outer surface and on the right on the inner surface.

With this information, you can draw a ring suitably shaded for the particular direction of light.

The first building-block has to be a quadrilateral for each face. This is drawn by joining two triangles together.

It should be possible to position it any-

where on screen so it is defined by four sets of co-ordinates. The faces are then joined in an ellipse to form the ring - by joining pairs of points together in two adjacent ellipses like:

```
DEF PROCcylinder(ey1,ew1,ey2,ew2,pal)
:
FOR D=-90 TO (270-step) STEP step
:
h1=w1/4:h2=w2/4
x1=SINRAD(D)*ew1:y1=(COSRAD(D)*h1)+ey1
x2=SINRAD(D+step)*ew1:y2=(COSRAD(D+step)*h1)+ey1
x3=SINRAD(D)*ew2:y3=(COSRAD(D)*h2)+ey2
x4=SINRAD(D+step)*ew2:y4=(COSRAD(D+step)*h2)+ey2
:
PROCquad(x1,y1,x2,y2,x3,y3,x4,y4)
NEXT D
:
ENDPROC
```

ew1 and ew2 represent the width of the top and bottom ring. The height of each ellipse is kept at one quarter of the width to give an effect of looking slightly down on the solid.

The heights are defined as h1 and h2 respectively. Changing the ratio between the width and height of the ellipse will change the appearance of the solid.

Setting the height to zero will give a straight side-on view although setting it to be equal with the width won't necessarily tilt the solid through 90 degrees. The variable, pal, controls the direction of the shading.



Shady dealings

Shading is achieved by using a selection of shades from left to right or vice versa depending on which way the shadow falls. On the Beeb the eight colours in mode 2 are used and these are ordered in an array first to make selection simpler.

Because you are using eight colours, the ring should be divided into 16 faces (eight for the front and eight for the back).

The main loop in PROCylinder therefore jumps in steps of $360/16 = 22.5$.

If you define a step to equal $(360/(\text{no. of shades} * 2))$, the colour of a face can be found

at any point on the ellipse with $\text{col}((D\%+90) \text{ DIV step})$.

When drawing a complete solid, such as a goblet, you have to take into account whether the inside of a surface will be visible or not.

If it is, the shadow will be reversed on the inside. So, you need to be able to reverse the palette when drawing the front of the ring.

By using the variable pal and checking whether the main loop is greater than 90 (front or back) the colour selection line becomes:

```
IF pal=2 AND D>90 THEN GCOL 0,7-col((D+90)
DIV step) ELSE GCOL 0,col((D+90) DIV step)
```

Listing 1 in the yellow pages contains the whole program to draw a goblet in mode 2 on a BBC micro. Lines 130 to 250 contain the definition of the goblet shape.

Note that lines 180 to 220 define a half-sphere by calculating the values for ew1, ew2, eh1 and eh2. Any shape can be defined by substituting your own lines.

A shade more solid

With the Archimedes, you can use 256 colours at any one time and because of the way the colours are arranged in 256 colour modes, it is possible to have up to seven colours of 12 shades each, all on screen at once.

A simple routine can be devised to select the desired colours from the palette.

The colour numbering on the Archimedes is quite complex. Two bits are used per blue, green and red level, plus two bits for the brightness. So, a colour is defined as:

```
colour% = (blue%<<4)+(green%<<2)+red%
```

If you wanted magenta (a combination of blue and red) you would calculate it as:

```
magenta = (3<<4)+(0<<2)+3 = 48+0+1 = 49
```

$a \ll b$ is a binary operation and means shift a by b places to the left.

Any colour can have an associated TINT value of 0-255. There are in fact only four distinct levels of brightness so it is more common to use the values 0, 64, 128 and 192 for tints. The desired colour is now selected by:

```
GCOL colour%
TINT tint%
```

It's now unnecessary for a look-up table as you have a method of calculating any colour.

By some simple maths, seven scales of colour (white, red, yellow, green, blue, cyan and magenta) can be selected.

Black is not used as its appearance on the computer screen is much too dark to be of any use.

Drawing a ring on the Archimedes is just a case of working out which colour and tint a particular face should be at any point on the ellipse. The colour can then be calculated like so:

```
colour = ((D%+90) DIV 60) MOD 3)+1
```

and the tint like so:

```
tint% = ((D%+90) DIV 15)*64
```

r%, g% and b% are used to allow the 'switching on or off' the three primary colours.

If you wanted a magenta scale, the green level should always be zero, so g% is set to 0 when the colour selection routine is called.

The colour selection routine then becomes:

```
red% = (((D%+90) DIV 60) MOD 3)+1)*r%
green% = (((D%+90) DIV 60) MOD 3)+1)*g%
blue% = (((D%+90) DIV 60) MOD 3)+1)*b%
tint% = ((D%+90) DIV 15)*64
```

The palette can be 'inverted' for shading inside surfaces by subtracting each of the colour levels from 2.

The maths for the Archimedes program is identical to that of the Beeb version. Listing 2 on the yellow pages draws one of the famous 10 green bottles using 12 shades of green on the Arc.

As it stands, designing a shape takes some experimentation.

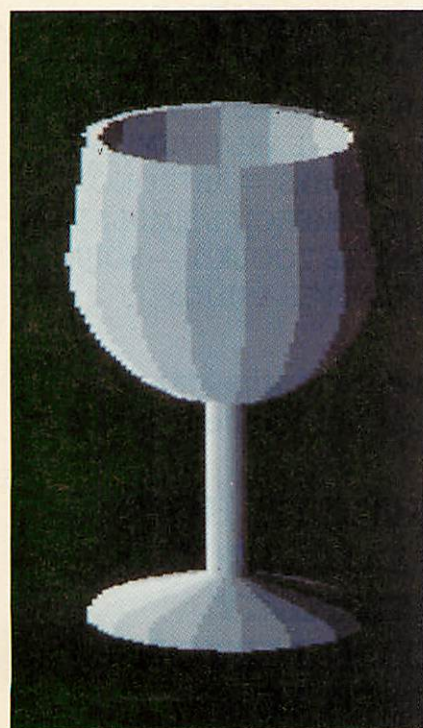
An obvious solution would be to set up an array to store the outline.

This could in turn be edited and updated using a simple line drawing program. Such a routine would be simple to append to the main program.

Another idea I've considered is mapping pictures onto the sides of objects.

By dividing the outline of a shape into small enough sections, it should be possible to stick a full screen onto the side of the goblet.

The two programs on the yellow pages in this issue, together with these suggestions, should encourage you to pursue your own ideas on the subject and we look forward to hearing from you about any enhancements or ideas you may have.



PAPER

Best quality wood-free - LOW DUST spec.

Type & Weight	Box	£/box
11/9.5 60gsm Fanfold Listing	2000	£13.95
11/9.5 70gsm Microperforated	2000	£15.95
11/9.5 85gsm Letter Quality	1000	£10.95
A4 Size 70gsm Microperforated	2000	£19.95
A4 Size 85gsm Letter Quality	1000	£11.95
11/9.5 NCR 2-part Plain	1000	£21.95
11/9.5 NCR 3-part Plain	700	£24.95
11/9.5 NCR 4-part Plain	500	£24.95
A5 Size 80gsm Letter Quality	1000	£11.95

RIBBON REFRESH

Our own invention - Carbon in a Can!

Simply lift off ribbon casing & apply fresh carbon to your ribbon - double its life in seconds!

One can does 20-100 ribbons

still just **£8.95**

NOW OVER 12000 SOLD!

CASPELL COMPUTER
of POOLE

ALL PRICES INCLUDE VAT
Delivery - see below

DISKS

25 x 5.25" Branded Quality	£13.95
50 x 5.25" Branded Quality	£24.95
25 x 3.5" 135tpi Branded	£24.95
50 x 3.5" 135tpi Branded	£47.95

LABELS

Address Labels 3.5" x 1.5" 1 or 2-across
£3.75 per 1000 + Carriage

RIBBONS

PRINTER

Amstrad	CODE No.	£
PCW8256 Fabric Longlife	2741	C
PCW8256 Colours	2741C	C
PCW8256 Multistrike Films	2741MS	B
PCW 9512 Fabric Longlife	2746	C
PCW9512 Colours	2746C	C
PCW9512 Multistrike Films	2746MS	B
DMP2000/2160/3000/3160	2482	A
DMP 4000	2426	D
LQ3500	2741LL	C
Other (Please ask if yours isn't here!)		
Brother HP15/25/40	2696MS	B
Brother M1009/1109/1209	2412	C
Commodore MPS-803	2412	C
Canon PW1080A	2223	C
Citizen 120D/180E/LSP-10	2488	B
Citizen MSP-20/40/50	2477	C
Citizen HQP-45	2478	E
Epson FX/MX/RX-80	2273	C
Epson LX/GX-80	2454	B
Epson LQ-500	2477	C
Epson EX-800	2774	C
Juki 6100 Daisywheel	2563MS	B
NEC Pinwriter P1/P2	2254	C
NEC Pinwriter P6+/P7+	2870	D
NEC P2200	2844	C
Panasonic KX-P1081	2228	C
Panasonic KX-P1180	2904	C
Seikosha GP100	2317	B
Seikosha SL80	2741	C
Seikosha 500/550	2236	C
Shinwa CP-80	2698MS	C
Star LC-10	2861	B
Star LC-10 Colours	2869	E
Star LC24-10	2868	B
Star NL-10	2761	C

RIBBON PRICES inc VAT & post

	1-off	2-off	5-off
Price Band A	£2.95	£5.75	£12.95
Price Band B	£3.95	£7.45	£16.95
Price Band C	£4.95	£8.95	£19.95
Price Band D	£5.95	£10.95	£22.95
Price Band E	£7.95	£14.95	£34.95

- HOW TO ORDER -

DELIVERY	PAPER (any quantity)	LABELS (any quantity)	EVERYTHING ELSE
UK Mainland:	3/5-day: £5.00 24-hour: £10.00	3/5-day: £2.50 24-hour: £10.00	3/5-day: FREE 24-hour: £10.00

Overseas: Postage at cost. Callers (of course!) FREE

Order by FREEPOST - Cheque/PO/Visa/Access
Caspell Computer, Dept BI, FREEPOST, Poole, Dorset BH15 2BR

Order by PHONE - VISA/ACCESS WELCOME!

(0202) 666155 (24hr)

CALLERS WELCOME at our Sales Centre
(Unit 2A, Sterte Ind Est, Sterte Rd, Poole)

Offers valid for 28 days

next to the hump-back bridge!

ACORN APPROVED

LONDON DEALER

Wide range of software and hardware stocked

Good prices

Easy to get to

Train: WOOD ST Station

(British Rail)

Road: Bottom of M11,

just off North Circular

Tel No: 01-521 1784



AUTOMATIC SERVICES
217 WOOD STREET
WALTHAMSTOW
LONDON E17 3NT

MEWsoft

For software that is
Friendly and
Easy to use.

The Fax*File Organiser

Address Book
Diary
User Defined Forms.

Combine the power of your BBC with the convenience and flexibility of a personal organiser to create a personalised data base.

"Simple but effective product, very easy to use". Acorn User
"Extremely friendly. I cannot fault it". Beebug.

The A4 Form Designer

School Registers
Assessment Sheets
Invoices

With this easy to use program you can design forms up to A4 size including lines, boxes, grids and text. Ideal for schools, small businesses and the home user.

"A cheap and effective program". Acorn User

(NB Needs Shadow RAM)

Fancy Labeller

Bookplates
Spice Jars
Disc Labels
etc

CAMDEN SCHOOL LIBRARY

Combine Fancy Fonts and Fancy Frames to make stylish labels. Many Uses.

"A simple but effective piece of software". Beebug

All programs £12.95 inc p.p
(ARC Versions available)
Phone for details
11 Cressy Road
Hampstead
London NW3 2NB
(Tel: 267 2642)

STAR DEVICES

- RESCUE — THE ADVENTURE
- JUMPING JACK — EARLY NUMERACY
- KEY TO THE STARS — ASTRONOMY
- TRADER — COMMERCIAL SIMULATION
- PROGRAMMERS TOOLKIT — SOUND ENVELOPES & UDCs

Software for the Star
Microterminal Ltd Concept keyboard

OLD SOLENT HOUSE
111/117, FOUNDRY LANE
SHIRLEY
SOUTHAMPTON
SO1 3GB
Tel: 0703 701694

READING MATTER

Transferring an old collection of Beeb discs into an Archimedes is a daunting task unless, like **DAVE LAWRENCE**, you have a program to do all the work for you

Many years ago, before the world was aware of things like Arms, Risc OS and ADFS, I owned a standard, unexpanded BBC model B. Many a long night was spent slaving over a hot tape recorder attempting to load or save my latest program.

After a couple of years, I decided enough was enough and went out to buy a disc upgrade for my trusty Beeb.

At that time, there were numerous companies offering such an expansion. Acorn and Watford Electronics both offered a DFS based around the rare (and expensive) 8271 disc controller.

The other options available used the more up-to-date WD1770 controller, which was smaller, cheaper and above all easily available.

It also had the advantage of supporting double density discs, allowing 640K to be crammed onto one disc.

Solidisk and Opus were the main contenders at the time (but who remembers the Kenda 'bar of chocolate' bodge board?).

The only potential problem of using one of these products was one of compatibility – would protected games still run correctly?

In the end, I opted for the Solidisk DDFS board which offered double density discs, unlimited file names per catalogue and a high degree of compatibility. (I later upgraded to its DFDS board, which held an 8271 as well as the 1770).

What I didn't foresee was the untimely death of my faithful Beeb but as by then I had an A440, I simply left my cache of old BBC software gathering dust in the corner.

Inevitably, the day recently arrived when I needed a program from one of my old discs, so I dutifully connected up all the relevant hardware to my Archimedes to read a 5.25in disc only to find the disc in question was in Solidisk double density extended catalogue format – unreadable by any of my DFS reader programs.

What ensued was an evening of frenzied button pressing and tea drinking with the *CopyDFS* program on the yellow pages as the outcome. This is capable of cataloguing and copying programs from a DFS disc into an ADFS directory on the Arc.

It will happily deal with Acorn discs, super-duper double extended Solidisk ones and with the old faithful 62-file Watford variety.



Using the program

First type in the program, save it somewhere and run it.

You will be presented with a box in the middle top of the screen containing seven options.

You can move between these using the up and down cursor keys.

The left and right cursor keys are used to change the option settings.

Most of these should be fairly self-explanatory and a little experimentation should give you the feel of the program.

The only other keys you need to know about are RETURN (which means go!) SHIFT-ESCAPE (which quits the program) and A, S and W.

These last three have been defined to set the first six options to appropriate values for reading Acorn, Solidisk and Watford discs respectively.

The Destination field should be filled in with the full pathname of the directory in which you wish to copy the DFS disc. It is not necessary to have previously created this directory.

If you ask the program to copy both sides of the Beeb disc, two further sub-directories Side0 and Side1 will be created.

Cataloguing discs

To catalogue a DFS disc set the drive, density, tracks, catalogue and side as required and set 'Operation' to 'Catalogue'. Don't forget you can use A, S or W if appropriate. Note the Destination directory is not needed, simply press RETURN.

The side number and number of files will be displayed along with a tabulated list of the files.

The program will then beep and wait for any key to be pressed before continuing.

Copying discs

To copy a DFS disc, proceed as for cataloguing but set 'Operation' to 'Copy' before pressing RETURN.

If there is anything wrong with the destination directory, you'll be informed and not allowed to continue until a valid name is entered.

If necessary, you'll be asked if you want to create the destination directory.

Once the program is happy with this, the file list will appear and the files will be copied. Each file is highlighted in green when read and red when written(!)

Single character sub-directories are created when necessary and illegal characters within ADFS filenames are changed to a '?' One slight problem comes when the destination directory becomes full.

There does not seem to be a SYS call to determine the number of entries left in a directory and it is not possible to read the number of existing files and subtracting it from the maximum number of files as this varies between filing systems and even between disc formats.

As a compromise, if the program finds a directory full, it deletes the last file it saved, creates a sub-directory called !!More then starts copying again from the previous file (the one just deleted) into this new directory.

Extensions

I have kept the program relatively short for the magazine but it is quite possible to add such luxuries as selective file copying, file investigation and even the ability to read other disc formats such as Opus or Watford double density. Those, I'll leave to you.

PROCinit	Set up variables and arrays
PROCset	Set options to one of three defaults (Acorn, Solidisk or Watford)
PROCerror	Deal with any errors
FNnaughty	Inform user of bad directory names
PROCwipe	Clear lower screen area
PROCdo	Display an option and its settings
PROCbox	Draw a bordered box
FNvariables	Accept key presses and update options
PROCsetparams	Set up information to read disc
PROCcopydisc	Copy a disc
PROCreadcat	Read the files of a disc side and use PROCstore to save their file information.
PROCget	Retrieve information for a given file
PROCshowcat	Display tabulate list of file names
PROCcopycat	Copy files to ADFS, creating further directories as necessary
FNsetblock	Set up a disc record to read single density discs. (Double density ones can be read directly with ADFS_DiscOp)
PROCread	Read some bytes from a given drive, side, track and sector

Table 1 Summary of FNs and PROCs

FACT SYSTEMS (Barrow) Ltd

19 Focus 303 Business Centre,
South Way, Walworth Industrial Estate
Andover, Hants SP10 5NY Tel: (0264) 334811 FREE PARKING

ARCHMEDES SPECIAL OFFER

SYSTEM	BASIC	MONO	COLOUR
A3000	£585	£655	£783
410/1	£1,079	£1,149	£1,275
420/1	£1,529	£1,599	£1,725
440/1	£2,249	£2,319	£2,445

ACCESSORIES

ACORN 1MB RAM UPGRADE £179
2ND FLOPPY DISK UPGRADE £113
ROM EXP CARD £53
I/O EXP CARD £78
MIDI ADD-ON TO I/O £37
MIDI EXP CARD £64
A3000 1MB RAM £179
A3000 USER PORT/MIDI £46
A3000 SERIAL UPGRADE £19
A3000 MONITOR STAND £29

LANGUAGES

ASSEMBLER, LISP, PROLOGX £174
FORTRAN 77, ISO-PASCAL £87
ARC BASIC COMPILER £87
ANSI-C £129

UTILITIES

ACORN TOOL BOX £174
CLARES TOOLKIT £44
INSTIGATOR £44
PC-EMULATOR £89
BEEBUG HEARSAY £55
TWIN £86

BUSINESS

NOMINAL LEDGER, PURCHASE
LEDGER, STOCK MANAGEMENT,
ORDER PROCESSING/INVOICING £51
SYSTEM DELTA PLUS £59
MAILSHOT £31
HOME ACCOUNTS £39

GAMES

HOLED OUT £16
E-TYPE £16
THE OLYMPICS £16
U.I.M £25
INTER-DICTATOR £25
ARCADE 3 £12
OVERLOAD £12
ARCADIUM £12
ALERION £12
ALFRION £12
ALL IN BOXING £12
JET FIGHTER £12
ORION £12
MISSILE CONTROL £12
CAVERNS £15
IBIX THE VIKING £15
THUNDER MONK £12
HOVER BOD £12
FREDDY'S FOLLY £12
CASINO £18
FAMILY FAVOURITES £18

MISCELLANEOUS

TEMPEST DTP £101
PIPEDREAM 3 £132
ALPHA-BASE £39
GRAPHIC WRITER £24
ARTISAN 2 £47
RENDER BENDER £63

BOOKS (NO VAT)

ASSEMBLY LANGUAGE £13
ARC OPERATING SYSTEM £13
PROG REF MANUAL £27
BASIC V £9

PLEASE ADD VAT AT 15%
FREE CARRIAGE ON ORDERS
OVER £100 ELSE £1.50
OPEN MON-SAT 9AM-5.30PM

HARDWARE AND SOFTWARE EXPANSION FOR THE ACORN ARCHIMEDES COMPUTER SYSTEM

EXPANSION CARDS

IEEE488 INTERFACE a full implementation of the standard for automatic test and measurement systems.

16 BIT PARALLEL I/O two 16 bit input or output ports with handshake lines for digital control applications

DUAL RS423 SERIAL INTERFACE for communicating with two additional RS423 or RS232 devices eg. printers, plotters, instruments, etc.

12 BIT ADC an analogue to digital converter capable of up to 166000 samples per second.

All the above high performance expansion cards are supplied with high level software for ease of use and a comprehensive user guide.

TERMULATOR For Archimedes Computers VT52, VT102, VT220 and Tektronix 4010 terminal emulations.

Termulator, a trade mark of Acorn Computers Limited, is applied to this product under licence from Acorn Computers Limited.

HARD DISC UPGRADES For Archimedes 400 Series Computers.

COMPLETE SYSTEMS All the standard models at competitive prices plus Archimedes 410 Computer fitted with 1 Mbyte RAM upgrade and 40 Mbyte internal hard disc - £1530.

AEG OLYMPIA PRINTERS Laserstar 6 - the ideal printer for Acorn Desktop Publisher

1.5 Mbytes of memory, HP LaserJet + compatible - £1298 optional Postscript emulation.

24 Pin Matrix Printers - IBM and Epson compatible

80 column - £411, 136 column £449.

24 Pin Colour Matrix Printer - IBM and Epson compatible

136 column - £524.

Ink Jet Printers Quietstar - HP DeskJet + compatible - £598.

Colourstar - HP PaintJet compatible - £748.

Officially appointed Acorn Scientific Dealer.



Intelligent Interfaces Ltd

43b Wood Street
Stratford-upon-Avon
Warwickshire
CV37 6JQ
Tel: 0789 415875
Fax: 0789 299600



THE SOFTWARE SHOWCASE IS FOR YOU THE

smaller software producer
special benefits include

- * Low rates and series discounts
- * High visibility
- * Free typesetting
- * Your own catagoric heading

If you have some interesting software to promote and don't want it lost among the larger advertisements then call now on (01) 490 1444 (Ext 1594) for the most cost effective advertising available.

FREE support with all our systems

- *Expert advice! on system purchase
- *Expert help! on using your system
- *Expert backup! software support and hardware servicing

Consult the experts!

CSS Computer Centre

Unit 3A Townfoot Ind. Est. BRAMPTON
Cumbria CA8 1SW
☎ 06977 3779

Acorn Qualified dealers and Unix centre

Authorised SJ Networks, installer *Education specialists
Government plc and education orders welcome

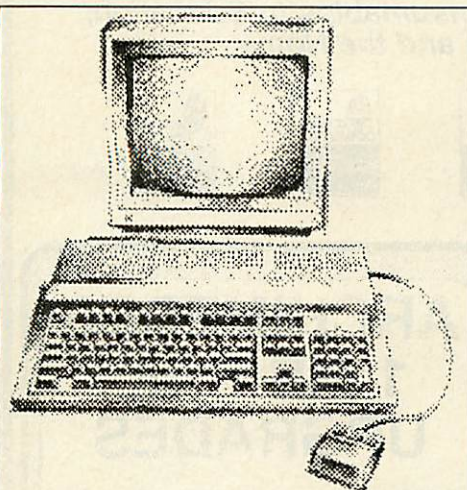


Acorn
The choice of experience.



DABHAND COMPUTING LTD

The Best in the North West ...



A 3000 base unit £599
A 3000 plus med. res. colour monitor & lead ... £779
A410/1 £1199
A420/1 *£1699
A440/1 *£2499

WE OPERATE THE TEACHERS, ACADEMICS & ACORN SHAREHOLDERS SCHEMES OFFERING GENEROUS DISCOUNTS AND EASY TERMS OF PAYMENTS, PLEASE RING FOR DETAILS

We don't think there is a better Archimedes deal around, but if you think different, call us and we will attempt to beat any advertised price.

ARCHIMEDES A3000

User & Midi Podule £46
 Serial Upgrade £19
 Monitor Stand (Acorn) £29
 Monitor Stand (Pres) £24
 OAK 20Mb SCSI disc Upgrade £549
 1 Mb RAM Expansion £149
 5.25" External floppy disc interface £15
 External 40/80T 5.25" c/w PSU £129

ARCHIMEDES 400 series

20 Mb Hard Disc Upgrade £189
 40 Mb Hard Disc Upgrade £319
 50 Mb Hard Disc Upgrade £459
 64 Mb Hard Disc Upgrade £499
 105 Mb SCSI Hard Disc £699
 215 Mb SCSI Hard Disc £999
 I/O Expansion Card £79
 Midi Expansion Card £65
 1 Mb RAM Upgrade £69
 OAK SCSI Board £189
 OAK SCSI 45 Mb Disc & Board £449
 ARM 3 Upgrade (30 MHZ) £595
 ARM 3 Upgrade (20 MHZ) £495
 5.25" External floppy disc interface £30
 Scanlight Junior Scanner (CC) £179
 Scanlight Senior Scanner (CC) £399
 Sheet Feeder for above (CC) £149
 Scavenger Junior Scanner (Beebug) £189

NEW RELEASES

Ring for availability

Apocalypse (3D Space Game - 4thDim.) £24.95
 FontFX (Special Effects for Draw/Impress) £12
 Datastore Utilities Disc £12
 The Pawn (Magnetic Scrolls Adventure) £26.04
 The Guild of Thieves (Mag.Scrolls Adv.) £26.04
 Rotor (Arcade Strategy Game) £19.95
 Talisman (Minerva Graphical Adv.) £12.95
 Battle Tank (Minerva) £12.95
 Maddingly Hall (Minerva Adv.) £12.95
 Trivial Pursuits £24.95
 Fireball II (Superb Breakout Game) £19.95
 Arc DFS (DFS Filing System) £26.04
 VIDC Enhancer (Modes 96 - 118) £29.95

CHECK OUT OUR PRICES!
NO UK CARRIAGE CHARGES
 (UK Residents add 15% VAT)

MONITORS

Philips CM8833 £225
Acorn badged Colour..... £199
EIZO 9060SZ Multisync . £475
Taxan 770+ Multisync £425

All monitors come with free lead. State computer type when when ordering.

ARCHIMEDES SOFTWARE

Acorn Desktop Publisher £119.95
 ANSI C V.3 Compiler + free C Front £139.95
 Arcade Soccer £14.95
 ArcComm (BBC Soft) £24.95
 Armadeus (Sound Sampler) £69.95
 Armadeus (Sampler Board) £139.00
 Artisan 2 (16 Colours) £49.95
 Atelier (Minerva 256 Colours) £79.95
 Casino (Minerva Desktop Games) £14.95
 Caverns (Minerva Arcade Game) £17.35
 C-Front (Mitre Front End for ANSI C) £17.35
 Disc Tree 2 (Mitre Hard Disc Utility) £39.95
 Euclid 2 (3D Drawing) £57.95
 E-Type (Driving Simulation) £14.95
 E-Type 100 Miles / Designer ea. £14.95
 Family Favorites (Minerva Compilation) £14.95
 First Word Plus V2 (Acorn) £79.95
 Fireball 2 (Superb breakout clone) £24.95
 Fugitives Quest (Robico Adventure) £23.95
 Genesis (Hypermedia System) £86.95
 Graphbox (Minerva) £69.95
 Holed Out (Golf Game) £14.95
 Holed Out Extra Courses, Designer £12.95
 Ibox the Viking (Arcade Adventure) £15.95

IMPRESSION NOW IN STOCK £139.95
 Interdictor (Flight Simulator) £24.95
 Mini Hyperpacks (3 games per pack) £24.95
HYPERPACK (12 Games) £79.95
 Multistore Database (Minerva) £199.00
 PC Emulator + free PCE Sh/ware 1&2 ... £99.00
 Pipedream 3 (WP) £129.00
 ProArtisan (256 Colours) £79.95
 Render Bender (Clares) £59.95
 Render Bender Demo Discs (Clares) £10.00
 Render Bender Demo Discs (Dabhand) £10.00
 Stranded (Robico Adventure) £23.95
 System Delta Plus (Minerva) £69.00
 Thundermonk (Arcade Adventure) £14.95
 Trivial Pursuit (Board game) £24.95
 U.I.M. (Submarine Battle) £24.95
 Worra Battle (Oak Tank Battle) £14.95
 Worra Plot (Draw > HPGL Plotter Driver) £24.95
 World Class Leader Board (U.S. Gold) .. £19.95

TERMS: UK residents add 15% VAT to all prices, except books. **Delivery FREE on all postal items in the UK.** Export, no VAT, carriage at cost. (quotations available). Europe maximum £2.50 software, £35 hardware. Access/Visa cards accepted by post/phone/in person. We are authorised Acorn dealers. Official orders accepted from public sector/education/PLCs, otherwise cash with order. Tender invitations welcome. Callers welcome. We are about 800yds north of J 17, M62. Fax: 061-766 8425. Price subject to change without notification. Goods offered subject to being unsold.

DABHAND COMPUTING (Dept AU)
 5 Victoria La, Whitefield, Manchester, M25 6AL

061 766 8423



SPECIAL OFFER

FREE WITH EVERY
410/1 - 3MB RAM - Price £1199
 (or 10% of marked price while stocks last)

BOOKS (no VAT)

C: A Dabhand Guide £14.95
 Archimedes Assembly Language £14.95
 Archimedes Operating System £14.95
Above Dabs Press books have accompanying disc - add £5 for 5.25", £7 for 3.5"
 Archimedes First Steps £9.95
 BASIC V: A Dabhand Guide £9.95
 RISCOS PRM's now in stock £79.95
 NEW Acorn DTP Advanced U.G. £14.95
 BBC Basic Guide (Acorn) £19.95
 Master 128 Ref. Man.Pts 1&2 (ea.) £14.95
 New Advanced User Guide £19.95
Additional Arc Software Manuals (Acomsoft)
 First Word Plus, DTP, Assembler (ea.) £10
 ANSI C Version 3 £29

SPECIALS

Voltmace Joystick (Replaces mouse) £24.95
 Draw Format Clip Art (Use with Draw/DTP) . £29.95
 Star LC10, Integrex, HP Paintjet colour printer sprite dumps (multitasking)..... £26.04

CONSUMABLES

3.5" Floppy Discs (10 in plastic box) £8.65
 Printer Ribbons (most makes) £call

MASTER COMPUTERS

Master 128 £399
 Master Colour Monitor £175
 Eprom Cartridge £10.95
 BBC Dust Covers £9.95

PORTABLE COMPUTING

Psion MC400 Mobile Computer £699
 Psion Organiser LZ64 £159
 Psion PC Comms Link £54
 Z88 32k Portable Computer £195
 Z88 All-in-one Pack £239
 Z88 - Arc Link £24.95
 Z88 - A Dabhand Guide (Book) £14.95
 128k RAM cartridge £41.26
 32k EPROM cartridge £16.48
 BBC Link £20.61
 Z88 SpellMaster £56.95
 Mains Adaptor £8.65
All Psion/Z88 accessories and s/ware available

PRINTERS

9-PIN PRINTERS (free lead)
 Citizen 120-D (Serial option add £20) £129
24-PIN PRINTERS (free lead)
 Panasonic KX-P1124 £249
 Sheet Feeder for above £99
 Citizen Swift 24 £299
 Colour Kit for above £39

COLOUR PRINTERS (free lead)
 Integrex Colourjet 132 £509
 HP Paintjet £795

LASER PRINTER (free lead)
 HP Laserjet IIP Printer £995
 Additional 1Mb RAM for IIP £199

JUST LOOK AT OUR PRICES FOR STAR PRINTERS!

LC10 £159
 LC10 Colour £189
 LC24-10 £209
 Sheet Feeders £59

HCCS ASSOCIATES

Nationwide Supplier of Computer Equipment,
Peripherals and Consumables to Education,
Business and the Home



HCCS
PRODUCTS
for
Archimedes

A400/1 SERIES UPGRADE KITS

From A410/1 to A420/1

£279.00

From A410/1 to A440/1

£660.00

ARCHIMEDES 1 MB RAM UPGRADES

BBC A3000, A400/1 Series

£100.00

NOTE: A410/1 can be upgraded to 2 or 4 MB

A400/1 HARD DRIVES

20MB **£195.00**

42MB **£289.00**

53MB **£499.00**

ALL HCCS PRODUCTS
CARRY A FULL ONE-YEAR
GUARANTEE

A3000 USER & ANALOGUE PORT INTERNAL MODULE

£45.00

Available April 1990

NEW

HCCS UPGRADED ARCHIMEDES

A410/1 Colour System 2MB RAM
& 20MB Hard Drive (=A420/1)

£1619.00

A410/1 Colour System 4MB RAM
& 53MB Hard Drive (=A440/1)

£1819.00

FREE FITTING & RETURN DELIVERY FOR ALL HCCS UPGRADES.

Machines are normally upgraded and
despatched within 5 working days of receipt.
Machines must be sent to HCCS in the
original packaging. HCCS cannot accept
responsibility for damage occurring during
incoming transit.

FUTURE PRODUCTS

HCCS have a policy of continuous
development of new products, upgrades
and peripherals for a range of
computers.

WATCH THIS SPACE

Acorn
The choice of experience.

HCCS also supply a full range of
peripherals and other computer related
products. Prices available on request.

BBC Master 128	£395.00
BBC A3000	£649.00
Acorn Colour Monitor	£220.00
A410/1 Computer	£1199.00
A410/1 Colour System	£1419.00
R140 Unix Workstation	POA

TERMS OF BUSINESS

15% VAT must be added to all prices.
Carriage free to anywhere on the UK
Mainland.

Cheques / P.O.'s made payable to:-

**HCCS ASSOCIATES
LIMITED**

575-583 Durham Road, Low Fell,
Gateshead, Tyne & Wear NE9 5JJ

Tel: 091 487 0760

Education price list available on request

Prices correct at time of printing. E&OE. Ring for latest prices. Items despatched within 48 hours of receipt of order, subject to stock and availability.

Gloucestershires fully Acorn approved sales
and service centre staffed by enthusiasts and experts

Full range of computers, software, books, peripherals etc

Note: We ONLY deal with Acorn Computers
We are not a 'Jack of all trades' dealer

Price match with any other reputable + fully approved
Acorn dealership on request
Free holiday accommodation
on all purchases over £250
on receipt of this advertisement

Phone for second hand and display prices
e.g. BBC B from £175, M128 £350, Compact Entry £275
Suppliers to education and industry

Fast repairs on the premises



Telephone: 0452 311031 Telex: 94082034 (AJLEL) G

24 HR. ANSWER SERVICE

49 CALTON ROAD, GLOUCESTER GL1 5DZ

Specialists also in high performance satellite Television systems

Member of The Confederation of Aerial Industries

ARCHIMEDES EXPANSION CARDS FROM WILD VISION

NEW HAWK V9

REAL TIME COLOUR DIGITISER

Captures single frames in full colour from
moving video images from camera or VCR.

The Hawk V9 is fully RISC-OS compatible and
desk top driven. Images are captured
as sprites. These are easily "dragged" into
Paint or ported into graphic packages such as
ProArtisan, Atelier, etc.

The Hawk V9 has applications whenever video
images are reproduced through the medium
of a computer. It is ideal for D.T.P.,
graphic arts and other video applications.

The Hawk V9 is provided with powerful
software to enhance image presentation.

Other Wild Vision Products include:

CHROMA 300 -

Video Overlay and Genlock System. Enables
Archimedes generated graphics and text to be
superimposed in full colour on a video signal from a
camera or VCR. Ideal for captioning videos.
Also available for A3000.

HAWK V10 -

Image Processing System designed to match the
high speed of the Archimedes. Captures, stores and
displays up to 4 video images in real time independently
of the host Archimedes.

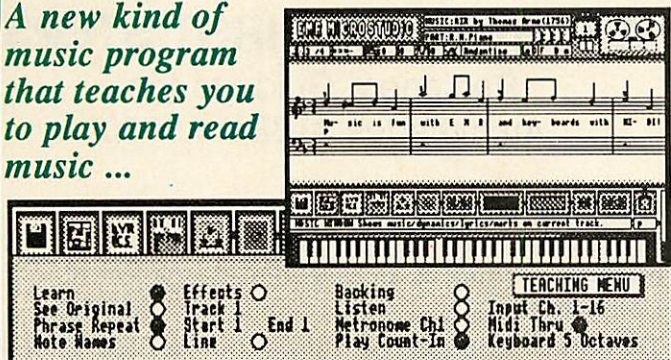
ADC1208-

High Speed Analogue/Digital I/O Card 12-bit,
8 channel analogue to digital converter, 166000
samples per second and 8-bit "user port" digital I/O.

Wild Vision specialise in the design and
manufacture of expansion cards for the
Archimedes, particularly for video applications.
Please contact us for further information, leaflets
and prices of these and our other products.

MICROSTUDIO

*A new kind of
music program
that teaches you
to play and read
music ...*



The first interactive learning program for all beginners!

- ★ Listen to the tune and accompaniment on your Midi keyboard
- ★ Learn any part by following the music pointer on-screen
- ★ The music waits for you to get it right at your own pace
- ★ Keyboard notes and names show where to put your fingers
- ★ A comprehensive teaching menu lets you choose many options
- ★ Enjoy learning as the ARC talks back to you, adds novel sound effects and even tells you when you make a mistake!
- ★ Learn ANY piece of music - create your own in MicroStudio - or Studio24Plus V2 for fingering, dynamics, tempo changes, etc

**Also designed for young people to use as a realtime
24-track recording studio for use with ANY Midi keyboard**

- ★ Edit notes from the Score Page and print each part on a dot-matrix printer - even transposed instantly for clarinet, sax, etc
 - ★ Write lyrics to your music and watch the music add the words
 - ★ Add extra ARC sounds from set provided or from Studio24Plus
- Price only £79 inc VAT (For all ARCs. Needs Acorn/EMR Midi Interface)
NEW Associated Board Piano & Inst. Grades discs for study in MicroStudio
NEW Music Library disc sets - Ghostbusters to Peer Gynt - from only £9.95
with easy-play music track as well as original music score parts to study.
EMR LTD, 14 Mount Close, Wickford, Essex SS11 8HG. Tel: 0702 335747

**Wild Vision**
6 JESMOND ROAD NEWCASTLE UPON TYNE NE24PQ
Tel: 091 281 8481 Fax: 091 281 5150

MORE NEW RELEASES FROM DABS PRESS

Z88 PipeDream: A Dabhand Guide

from John Allen - expert Z88 journalist

PipeDream, the built in word processor, spreadsheet and database built into the Z88 is an extremely powerful tool, and John Allen, author of many articles of the Z88, and experienced user has produced what must be the ultimate tutorial and reference work on the software. With many example documents and templates, this book takes you from first principles to a thorough understanding of the program. Linking to PipeDream on other machines such as the BBC and Archimedes is also covered.

Only £14.95 all inclusive

AVAILABLE 24th APRIL

Also still available is our first book on the famous Cambridge portable marvel, Z88: A Dabhand Guide, written by Trinity Concepts, authors of the Z88 operating system. Also priced at £14.95

THE LATEST DABHAND GUIDE

We have moved! Please note our new address and telephone number for all correspondence.

**DABS PRESS (AU5)
22 WARWICK STREET
PRESTWICH
MANCHESTER
M25 7HN
TEL: 061-773 8632
FAX: 061-773 8290**

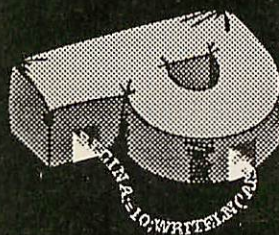
For personal callers Warwick St. is in the centre of Prestwich Village, just off Bury New Road.

Dabs Press books and software are available from all good bookshops and Acorn dealers, or in case of difficulty direct from the above address. Access/Visa/official orders accepted. Free catalogues on request. Prices include 15% VAT (on software) and UK postage. Foreign deduct VAT but add £2.50 Europe/surface, £12 airmail.

061-773 8632

CAMBRIDGE PASCAL

Full featured Pascal Compiler for the Acorn
Archimedes



**DABS
PRESS**

Cambridge Pascal is a comprehensive version of the Pascal language and includes many extra enhancing features over the standard specification including full dynamic string handling, local error handling, random access files, direct access to 'star' commands and RISC OS SWI calls. It is 100% Desktop compatible but can

also be run from the command line. All programs compile into fast, efficient machine code.

Cambridge Pascal requires any Archimedes running RISC OS with at least 1Mb of RAM. Hard discs and extra memory are useful, but the system is perfectly workable with this minimum configuration.

Price £79.95 (£69.52+VAT). Site licences available. Free demonstration disc and full specification sheet available on request.

DEMO DISC FREE ON REQUEST

ARCHIMEDES FIRST STEPS

Beginners Guide to the
Archimedes & BBC A3000

This book is the perfect introductory guide to the Archimedes, to guide you through the first few months of ownership, acting as an easy-to-read supplement to the User Guide.

The book describes in detail how to put the RISC OS Desktop to best use, and also documents the programs on the Applications Discs provided with the machine.

But the book also goes beyond this and describes the sort of software and hardware additions available to the Archimedes owner, and how to choose and install them.

The many features of this book include:

- Applicable to all Archimedes with RISC OS
- Using the Desktop, RAMdisc and ADFS
- Edit, Paint, Draw and Maestro
- The Task Manager
- The BBC and PC emulators
- Hardware and software additions
- Illustrated throughout

AVAILABLE NOW!

PRICE £9.95

ONE OF OUR BEST SELLERS

COMPATIBILITY

Program	Page	BBC B	B+/128	Master 128	Master Compact	Electron	Arc	6502SP/Turbo	ADFS	Econet	Shadow RAM	Monthly Disc
Music	17											
Listing 1		■	■	■	■				■	■	■	■
Risc Revue	30											
Listings 1-6							■		■	■	■	■
Eight Bits	58											
Listings 1-2		■	■	■	■	■		■	■	■	■	■
Listings 3-4(1)		■	■	■					■	■	■	■
New Modes	64											
Listings 1-4							■		■	■	■	■
Strum	66											
Listing 1		■	■	■	■			■	■	■	■	■
Life	73											
Listings 1-2		■	■	■	■			■	■	■	■	■
Multi Precision	75											
Listings 1-2		■	■	■	■			■	■	■	■	■
Pottery	81											
Listing 1		■	■	■	■	■	■	■	■	■	■	■
Listing 2							■		■	■	■	■
Discs	83											
Listing 1							■		■	■	■	■

Note: (1) requires 512 second processor

MUSIC

Listing 1

```

10 REM Music 5000 Sample Player
20 REM by Hybrid Technology
30 REM for B/B+/H/C
40 REM BAU May 1990
50 :
60 REM Initialises synthesiser to con-
tinuously output through its DAC
70 REM the value of a single register
written by the driving program.
80 CLS
90 PRINT "Direct-DAC access on Music
5000"
100 :
110 waven=2^8 : REM 2^n, where n is
integer - smaller n can be used
120 lrange=128:dacbits=7:dacfractbits
=4
130 DIM code% 1000, wave waven,logta-
ble lrange
140 :
150 PRINT "please wait..."
160 :
170 PROCass(code%,0):PROCass(code%,2)
180 PROCinitsynth:PROClogtab
190 :
200 PRINT "making sine wave..."
210 FOR IX=0 TO waven-1
220 val=127*SIN(((IX/waven+1))*2*PI)
230 wave?IX=ABS(val) OR (SGN(val) AND
880)
240 NEXT
250 PROCplay
260 :
270 PRINT "making 'FM brass' wave..."
280 FOR IX=0 TO waven-1
290 val=127*SIN(((IX/waven+1)^2.5)*2
*PI)
300 wave?IX=ABS(val) OR (SGN(val) AND
880)
310 NEXT
320 PROCplay
330 :
340 PRINT "making ramp wave..."
350 FOR IX=0 TO waven-1
360 val=127*(IX/(waven DIV 2)-1)
370 wave?IX=ABS(val) OR (SGN(val) AND
880)
380 NEXT
390 PROCplay
400 :
410 PRINT "making square wave..."
420 FOR IX=0 TO waven-1
430 val=127*(IX/(waven DIV 2)-1)
440 wave?IX=87F OR (SGN(val) AND 880)
450 NEXT
460 PROCplay
470 :
480 PRINT "making pulse wave..."
490 FOR IX=0 TO waven-1
500 wave?IX=87F OR (880 AND (IX>(waven
en/8)))
510 NEXT
520 PROCplay
530 :
540 PRINT "finished."
550 END
560 :
570 DEF PROCplay
580 PRINT "playing single tone..."
590 PROCsetfreq(500):AX=255:CALLplay
600 d=INKEY(100)
610 PRINT "playing rising sequence..."
620 d=INKEY(100)
630 thisfreq=100
640 REPEAT thisfreq=thisfreq*2^(1/6):P
ROCsetfreq(thisfreq)
650 AX=thisfreq/10
660 CALL play
670 UNTIL thisfreq>2550
680 d=INKEY(100)
690 PRINT "playing 'computer speech'..."
700 d=INKEY(100)
710 FOR IX=0 TO 24:PROCsetfreq(RND(400
0)+400):AX=50:CALL play:NEXT
720 ENDPROC
730 :
740 DEF PROCsetfreq(f%):!freq=f%*(wave
len/256)
750 ENDPROC
760 :
770 DEF PROCass(P%,opt%)
780 [OPT opt%]
790 \ variables
800 .icount EQU 0
810 .phase EQU 0
820 .freq EQU 0
830 :
840 .play \ play test sound for A supe
r-cycles (cycles * 256/waven)
850 :
860 SEI
870 STA .icount
880 .innerloop
890 \ evaluate next sample from digit
al oscillator
900 LDA phase:CLC:ADC .freq:STA phase
910 LDA phase+1:ADC .freq+1:STA phase+1
920 PHP \ store end-of-cycle flag (C)
930 :
940 \ transform into current wave shap
e
950 AND #waven-1:TAX:LDA wave,X
960 :
970 JSR senda
980 :
990 PLP
1000 \CLI:RTS
1010 BCC .innerloop \ end of
super-cycle?
1020 DEC .icount:BNE .innerloop \ end of
note?
1030 CLI
1040 :
1050 RTS
1060 :
1070 \ \ \ BELOW THIS LOADLOMEN, BASIC AN
D ASSEMBLER ROUTINES FOR GENERAL USE \ \ \
1080 \ \ \ general code sequence for send
ing A to DAC \ \ \
1090 .sendA
1100 \ convert A into logarithmic form
for sending to synthesiser
1110 TAX:ROL A:TAX
\ put si
gn bit in carry
1120 AND #87F
\ Remove
sign bit
1130 TAX
1140 LDA logtable,X
\ Conver
t to log
1150 ROR A
\ Put si
gn bit back on
1160 :
1170 STA &FD00
to synthesiser
1180 RTS
1190 :ENDPROC
1200 :
1210 DEF PROClogtab
1220 linscale=(2^(2^(dacbits-dacfractbit
s))-1)/lrange
1230 logscale=2^dacfractbits/LN2
1240 FOR IX=0 TO lrange-1:logtable?IX
=logscale*LN(1X*linscale+1)*2:NEXT
1250 ENDPROC
1260 :
1270 DEF PROCinitsynth
1280 ?8FCFF=&B3E
1290 FOR IX=&FD00 TO &FDFF:?IX=&B2:NEXT
1300 FOR IX=&FD00 TO &FDFF:?IX=&B0:NEXT
1310 PROCset(&FD70,&D)
1320 PROCset(&FD50,0):PROCset(&FD60,&80)
1330 PROCset(&FD00,&FE):PROCset(&FD20,&80)
1340 PROCset(&FD00,1):PROCset(&FD10,0):
PROCset(&FD20,0)
1350 ?8FCFF=&B30
1360 ENDPROC
1370 :
1380 DEF PROCset(addr%,data%)
1390 FOR AX=0 TO 128 STEP 128
1400 addr?AX=data%
1410 NEXT
1420 ENDPROC

```

RISC REVUE

Listing 1

```

10 REM >SphereGen (RR1)
20 REM Create sphere sprite
30 REM by Philip Armstrong
40 REM for Archimedes only
50 REM (c) BAU May 1990
60 :
70 MODE 9
80 PROCgreys
90 r%=35
100 ox%=r%
110 oy%=r%
120 sp=&2E
130 SYS sp%,9
140 SYS sp%,15,, "Ball",0,r%/2+1,r%/2+1
150 SYS sp%,29,, "Ball"
160 SYS sp%,60,, "Ball" TO R0,R1,R2,R3
170 r2%=r%*r%
180 FOR Y%=0 TO r% STEP -4
190 AY%=(DEG(ASN(Y%/r%))-24)*2
200 x%=SQR(r2%-Y%*Y%)/DIV4*4
210 FOR X%=-x% TO x% STEP 4
220 c%=SQR((DEGASN(X%/r%)-24)^2+AY%)/8
+RND(1)
230 IF c%>14 GCOL 0,15 ELSE GCOL 0,c%+
1
240 POINT ox%+X%,oy%+Y%
250 NEXT
260 NEXT
270 FOR X%=0 TO 2*r% STEP 4
280 FOR Y%=0 TO 2*r% STEP 4
290 IF POINT(X%,Y%)=0 SYS sp%,44,, "BAL
L",X%/4,Y%/4,0
300 NEXT
310 NEXT
320 SYS sp%,R0,R1,R2,R3
330 *SCHOOSE Ball
340 GCOL 8,0
350 PLOT &ED,500,500
360 PLOT &ED,550,550
370 save$="Ball"+STR$(MODE)
380 OSCLI"SSAVE "+save$
390 PRINT"Sprite saved as "+save$""
400 END
410 :
420 DEF PROCgreys
430 FOR c%=0 TO 15
440 ax%=(15-c%)*16

```

Continued ►

RISC REVUE

Continued

```
450 COLOUR c%,a%,a%,a%
460 NEXT
470 ENDPROC
```

Listing 2

```
10 REM >SphereDemo (RR2)
20 REM 3D Demonstration
30 REM by Philip Armstrong
40 REM for Archimedes only
50 REM (c) BAU May 1990
60 :
70 ON ERROR MODE 0:PRINTREPORTS,ERL:IE
ND
80 pnts%=40
90 zcutoff%=10
100 MODE 9+128
110 IF MODE=12 OR MODE=9 PROCgreys
120 DIM x%(pnts%),y%(pnts%),z%(pnts%)
130 DIM x1%(pnts%),y1%(pnts%),z1%(pnts%)
140 ssize=8FBB
150 DIM sp ssize%
160 !sp=ssize%
170 sp_op=46
180 DIM scale 16
190 NX=1
200 PROCswap
210 CLS
220 PROCswap
230 sp!4=0
240 sp!8=16
250 sp!12=16
260 files="Ball!"+STR$MODE
270 sprs="Ball!"
280 SYS sp_op,266,sp,files
290 ORIGIN 640,512
300 OFF
310 PROCinit
320 MOUSE ON 0
330 REPEAT
340 MOUSE y1%,x1%,B%
350 c%=INKEY$(0)
360 IF c%=ASC(c$)-48
370 CX=CX+0 AND CX<7 SH% = CX
380 PROCnew
390 ss%=4
400 CASE TRUE OF
410 WHEN INKEY(-10):zp%=-ss%
420 WHEN INKEY(-12):zp%+=ss%
430 WHEN INKEY(-26):xp%+=ss%
440 WHEN INKEY(-122):xp%-=ss%
450 WHEN INKEY(-42):yp%+=ss%
460 WHEN INKEY(-58):yp%-=ss%
470 ENDCASE
480 time%=TIME
490 PROCrotate
500 CLS
510 PROCplot
520 PRINTTAB(0,0);(TIME-time%)/100;" S
hape ";sh%
530 PROCswap
540 UNTIL FALSE
550 END
560 :
570 DEF PROCinit
580 x1%=0:y1%=0:z1%=0
590 xp%=0:yp%=0:zp%=100
600 pros%=1000
610 scale!8=100
620 scale!12=100
630 size%=6
640 sh%=1
650 PROCnew
660 ENDPROC
670 :
680 DEF PROCrotate
690 FOR IX=1 TO PTX
700 c=COSRAD(z1%)
710 s=SINRAD(z1%)
720 x2%=x%(IX)*c-y%(IX)*s
730 y2%=y%(IX)*c+x%(IX)*s
740 c=COSRAD(y1%)
750 s=SINRAD(y1%)
760 x2%=x2%(IX)*c+z1%(IX)*s
770 x2%=x2%(IX)*c-z1%(IX)*s
780 c=COSRAD(x1%)
790 s=SINRAD(x1%)
800 tx%=y2%
810 y2%=y2%*c-z2%*s
820 z2%=z2%*c+tx%*s
830 x1%(IX)=x2%*xp%
840 y1%(IX)=y2%*yp%
850 z1%(IX)=z2%*zp%
860 NEXT
870 PROCsort
880 ENDPROC
890 :
900 DEF PROCplot
910 FOR IX=1 TO PTX
920 IF z1%(IX)>zcutoff% THEN
930 IF z1%(IX)=0 fact=pros%/0.1 ELSE f
act=pros%/z1%(IX)
940 S%=fact/size%*100
950 scale!0=S%
960 scale!4=S%
970 SYS sp_op,308,sp,spr$, (fact*x1%(IX)
```

```
), (fact*y1%(IX)),B,scale
980 ENDIF
990 NEXT
1000 ENDPROC
1010 :
1020 DEF PROCswap
1030 SYS 6,113,N%
1040 NX=N% EOR 2+1
1050 SYS 6,112,N%
1060 ENDPROC
1070 :
1080 DEF PROCsort
1090 FOR IX=1 TO PTX-1
1100 TX=z1%(IX)
1110 PX=IX
1120 FOR JX=IX+1 TO PTX
1130 IF z1%(JX)>TX TX=z1%(JX):PX=JX
1140 NEXT
1150 SWAP z1%(IX),z1%(PX)
1160 SWAP x1%(IX),x1%(PX)
1170 SWAP y1%(IX),y1%(PX)
1180 NEXT
1190 ENDPROC
1200 :
1210 DEF PROCgreys
1220 FOR CX=0 TO 15
1230 AX=(15-CX)*16
1240 COLOUR CX,AX,AX,AX
1250 NEXT
1260 ENDPROC
1270 :
1280 DEF PROCnew
1290 PTX=0
1300 rad%=30
1310 CASE sh% OF
1320 WHEN 1:PROCplane
1330 WHEN 2:PROCdisc(0)
1340 WHEN 3:PROCdisc(1)
1350 WHEN 4:PROCshapes(0,359,90,90,359+
90,180)
1360 WHEN 5:PROCshapes(0,359,60,0,359,6
0)
1370 WHEN 6:PROCreaddata
1380 ENDCASE
1390 ENDPROC
1400 :
1410 DEF PROCplane
1420 FOR XX=-30 TO 30 STEP 30
1430 FOR YY=-30 TO 30 STEP 30
1440 PTX+=1
1450 x%(PTX)=XX
1460 y%(PTX)=YY
1470 z%(PTX)=0
1480 NEXT
1490 NEXT
1500 ENDPROC
1510 :
1520 DEF PROCdisc(fx)
1530 FOR A=0 TO 359 STEP 30
1540 PTX+=1
1550 x%(PTX)=radX*SINRAD(A)
1560 y%(PTX)=radX*COSRAD(A)
1570 z%(PTX)=0
1580 IF A<0 AND A>180 AND fx PTX+=1:z
X(PTX)=x%(PTX-1):yX(PTX)=yX(PTX-1):xX(PT
X)=0
1590 NEXT
1600 ENDPROC
1610 :
1620 DEF PROCshapes(b1%,f1%,s1%,b2%,f2%
,s2%)
1630 FOR A=b1% TO f1% STEP s1%
1640 PTX+=1
1650 xX(PTX)=radX*SINRAD(A)
1660 yX(PTX)=radX*COSRAD(A)
1670 zX(PTX)=0
1680 NEXT
1690 FOR A=b2% TO f2% STEP s2%
1700 PTX+=1
1710 zX(PTX)=radX*SINRAD(A)
1720 yX(PTX)=radX*COSRAD(A)
1730 xX(PTX)=0
1740 NEXT
1750 ENDPROC
1760 :
1770 DEF PROCreaddata
1780 RESTORE +0:REM cube
1790 REPEAT
1800 PTX+=1
1810 READ xX(PTX),yX(PTX),zX(PTX)
1820 UNTIL xX(PTX)=999 OR PTX=pnts%-1
1830 PTX-=1
1840 ENDPROC
1850 :
1860 DATA 20,-20,-20,20,20,-20,20,20,
20,20,-20,20
1870 DATA -20,-20,-20,-20,20,-20,-20,
20,20,-20,-20,20
1880 DATA 999,999,999
```

Listing 3

```
10 REM >ARMSort (RR3)
20 REM A fast sort routine
30 REM by Dave Acton
40 REM for Archimedes only
50 REM (c) BAU May 1990
60 :
```

```
70 MODE 0
80 DIM code% 8400
90 PROCass
100 INPUT "How many objects? "objects%
110 IF objects%<=0 objects%=2000
120 PRINT "Building random table..."
130 seed%=RND(-80CA)
140 DIM dx 4*objects%
150 FOR ix=0 TO objects%-1
160 dx!(4+ix)=RND(100000)
170 NEXT
180 CLS
190 PRINT "Objects to sort: ";objects%'
200 PRINT "Before:"
210 PROCshow(objects%/10)
220 TIME=0
230 PROCquicksort(dx,objects%)
240 tx=TIME
250 PRINT "After:"
260 PROCshow(objects%/10)
270 PRINT "Time taken: ";tx/100
280 END
290 :
300 DEF PROCshow(step%)
310 LOCAL ix
320 IF step%<1 step%=1
330 FOR ix=0 TO objects%-1 STEP step%
340 PRINTix,dx!(4+ix)
350 NEXT
360 ENDPROC
370 :
380 DEF PROCquicksort(AX,BX)
390 CALL qsort
400 ENDPROC
410 :
420 DEF PROCass
430 qsa=0:qsn=1
440 qsi=2:qsj=3
450 qsp=4
460 qstemp1=5
470 qstemp2=6
480 sp=13:link=14:pc=15
490 FOR pass%=0 TO 2 STEP 2
500 PX=code%
510 CORT pass%
520 .qsort
530 STMFd (sp!), (link)
540 MOV qsi, #0
550 LDR qstemp1,[qsa]
560 .findpivot
570 LDR qstemp2,[qsa,qsi,ASL #2]
580 CMP qstemp1,qstemp2
590 BNE gotpiv
600 ADD qsi,qsi,#1
610 CMP qsi,qsn
620 BNE findpivot
630 LDHFD (sp!), (pc)
640 .gotpiv
650 MOVST qsp,qstemp1
660 MOVLE qsp,qstemp2
670 MOV qsi, #0
680 SUB qsi,qsn,#1
690 CMP qsi,qsj
700 BGT parted
710 .partloop
720 .partla
730 LDR qstemp1,[qsa,qsi,ASL #2]
740 CMP qstemp1,qsp
750 ADULT qsi,qsi,#1
760 BLT partla
770 .partlb
780 LDR qstemp2,[qsa,qsi,ASL #2]
790 CMP qstemp2,qsp
800 SUBGE qsj,qsj,#1
810 BGE partlb
820 CMP qsi,qsj
830 BGE noswap
840 STR qstemp1,[qsa,qsi,ASL #2]
850 STR qstemp2,[qsa,qsi,ASL #2]
860 ADD qsi,qsi,#1
870 SUB qsj,qsj,#1
880 .noswap
890 CMP qsi,qsj
900 BLE partloop
910 .parted
920 STMFd (sp!), (qsa,qsi,qsn)
930 MOV qsn,qsi
940 BL qsort
950 LDHFD (sp), (qsa,qsi,qsn)
960 ADD qsa,qsa,qsi,ASL #2
970 SUB qsn,qsn,qsi
980 BL qsort
990 LDHFD (sp!), (qsa,qsi,qsn,pc)
1000 J
1010 NEXT pass%
1020 ENDPROC
```

Listing 4

```
10 REM >Planets (RR4)
20 REM by Barry Wickett
30 REM for Archimedes only
40 REM (c) BAU May 1990
50 :
60 DIM radius(10),time(10),angle(10),
names(10)
70 MODE 8
```

```
80 screenbank=1
90 orbit=TRUE
100 xscale=0.2
110 yscale=0.1
120 ORIGIN 640,512
130 MOUSE RECTANGLE 30,30,300,300
140 :
150 FOR planet=1 TO 9
160 READ name$(planet),radius(planet),
time(planet)
170 radius(planet)=SQR(radius(planet))
180 NEXT planet
190 :
200 FOR planet=1 TO 9
210 angle(planet)=((Pi*2)/(time(planet)
))) * 86400
220 NEXT planet
230 :
240 days=0
250 REPEAT
260 MOUSE mx,my,mz
270 GCOL 0,0
280 RECTANGLE FILL -640,-512,1280,1023
290 PRINT TAB(0,0); "Days ";days
300 GCOL 0,2
310 CIRCLE FILL 0,0,25
320 IF orbit=TRUE AND mz=0 THEN
330 GCOL 0,1
340 FOR planet=1 TO 9
350 ELLIPSE 0,0,(radius(planet)/11E+2)
*xscale*(mx/100),(radius(planet)/11E+2)*
yscale*(my/100)
360 NEXT planet
370 ENDIF
380 GCOL 0,3
390 FOR planet=1 TO 9
400 X=(COS(angle(planet)*days)*radius(
planet)/11E+2)*xscale*(mx/100)
410 Y=(SIN(angle(planet)*days)*radius(
planet)/11E+2)*yscale*(my/100)
420 CIRCLE FILL X,Y,10
430 MOVE X+16,Y
440 VDU 5
450 PRINT name$(planet)
460 VDU 4
470 NEXT planet
480 WAIT
500 SYS "OS_Byte",112,screenbank
510 screenbank=3-screenbank
520 SYS "OS_Byte",113,screenbank
530 days+=1
540 UNTIL FALSE
550 :
560 DATA Mercury,5.79E+10,7.6E+6
570 DATA Venus,1.08E+11,1.94E7
580 DATA Earth,1.49E+11,3.16E+7
590 DATA Mars,2.28E+11,5.94E+7
600 DATA Jupiter,7.78E+11,3.74E+8
610 DATA Saturn,1.43E+12,9.3E+8
620 DATA Uranus,2.87E+12,2.66E+9
630 DATA Neptune,4.50E+12,5.20E+9
640 DATA Pluto,5.9E+12,7.82E+9
```

Listing 5

```
10 REM >FKeys (RR5)
20 REM by Dave Acton
30 REM for Archimedes only
40 REM (c) BAU May 1990
50 :
60 PROCinitkeys
70 PRINT "Press keys to see codes prod
uced..."
80 REPEAT
90 key=FInkey(10)
100 IF key=>0 PRINT"&";RIGHT$("00"+STR
$-key,3)
110 UNTIL key=27
120 PROCreset
130 END
140 :
150 DEF PROCinitkeys
160 FOR osb%>221 TO 228
170 SYS "OS_Byte",osb%,2
180 NEXT
190 *FX 4,2
200 *FX 229,1
210 ENDPROC
220 :
230 DEF PROCreset
240 FOR osb%>221 TO 228
250 SYS "OS_Byte",osb%,0
260 NEXT
270 *FX 4
280 *FX 229
290 PRINT REPORTS" at line ";ERL
300 ENDPROC
310 :
320 DEF FInkey(delay)
330 LOCAL k,k2
340 k=INKEY(delay)
350 IF k<>0 THEN k=k
360 k2=INKEY(0)
370 IF k2<>0 THEN k=k2
380 =>100+k2
```


Listing 6

```

10 REM >FileTypes (RR6)
20 REM OS Variable Demo
30 REM by Dave Acton
40 REM for Archimedes only
50 REM (c) BAU May 1990

60 :
70 DIM useful% &100
80 PRINT "Named filetypes:"
90 SYS "OS_ReadVarVal", "File$Type_###
",useful%,&100,0,3 TO ,,L%,p%

100 WHILE L%>0
110 useful%?L%=13
120 PRINT$useful%,
130 SYS "XOS_ReadVarVal", "File$Type_##
##",useful%,&100,p%,3 TO ,,L%,p%

140 ENDWHILE
150 PRINT
160 END

```

EIGHT BITS

Listing 1

```

10 REM Demon Cyclic Space
20 REM by Phil Bender
30 REM for B/B+/M/C/E
40 REM (c) BAU May 1990
50 :
60 *TV0,1
70 MODE2
80 HIMEM=&2000
90 VDU23,8202,0,0;
100 PROCass
110 PROCSetup
120 PRINT "Press: - "" P to pause""
" 0 to resume"" Q to quit"
130 REPEAT
140 INPUT "Max value (1-15) "M%
150 M%=M%AND15
160 ?&77=M%
170 !rand=-TIME
180 CALL Init
190 REPEAT CALL prog
200 IF INKEY=56 REPEAT UNTIL INKEY=55
210 UNTIL INKEY=17
220 CLS
230 PRINTTAB(4,10)"Again? (Y/N)"
240 REPEAT Q%=GET AND &DF
250 UNTIL Q%=78 OR Q%=89
260 UNTIL Q%=78
270 END
280 DEFPROCSetup
290 FORJ%=0TO15
300 READ byte%,screen%
310 bytab%?screen%=byte%
320 scrtab%?byte%=screen%
330 NEXT
340 DATA0,0,1,1,2,4,3,5,4,16,5,17,6,20
,7,21
350 DATA8,64,9,65,10,68,11,69,12,80,13
,81,14,84,15,85
360 FOR J%=0 TO 15
370 READ CX
380 VDU19,J%,CX,0;
390 NEXT
400 DATA 0,6,2,3,1,5,4,7,0,6,2,3,1,5,4
,7
410 ENDPROC
420 DEFPROCass
430 inbuff=&2080
440 lbuff=&2E00
450 mbuff=&2E80
460 rbuff=&2F00
470 outbuff=&2F80
480 bytab=&2D00
490 scrtab=&2D60
500 coltop=&70
510 aplus=&72
520 temp=&73
530 tempy=&74
540 column=&75
550 aplus=&76
560 max=&77
570 tempa=&78
580 rand=&80
590 FOR opt=0 TO 2 STEP 2
600 PX=&8200
610 LOPT opt
620 SEI
630 .prog
640 LDA#0
650 TAX \zerobuffs
660 .loopH
670 STA &2E00,X
680 STA &2F00,X
690 INX
700 BNE loopH
710 LDX #79
720 JSR readcol
730 JSR rpix
740 JSR movebuffs
750 LDX #0
760 STX column
770 JSR readcol
780 JSR lpix
790 .mainloop
800 JSR movebuffs
810 JSR rpix
820 LDA #0
830 TAY
840 .loopJ
850 STA outbuff,Y
860 INY
870 BPL loopJ
880 JSR new
890 LDX #0
900 .loopK
910 ASL outbuff,X

920 INX
930 BPL loopK
940 JSR movebuffs
950 LDX column
960 INX
970 CPX #80
980 BNE notlast
990 LDX #0
1000 .notlast
1010 JSR readcol
1020 JSR lpix
1030 JSR new
1040 LDX column
1050 JSR writocol
1060 INX
1070 STX column
1080 CPX #80
1090 BNE mainloop
1100 CLI
1110 RTS
1120 \ subs
1130 .getcoltop
1140 STX coltop
1150 LDA #0
1160 ASL coltop
1170 ROL A
1180 ASL coltop
1190 ROL A
1200 ASL coltop
1210 ROL A
1220 ADC #830
1230 STA coltop+1
1240 RTS
1250 :
1260 .readcol
1270 STX tempx
1280 JSR getcoltop
1290 LDX #0
1300 .loopA
1310 LDY #0
1320 .loopB
1330 LDA (coltop),Y
1340 STA inbuff,X
1350 INX
1360 INY
1370 INY
1380 CPY #8
1390 BNE loopB
1400 LDA coltop
1410 CLC
1420 ADC #800
1430 STA coltop
1440 LDA coltop+1
1450 ADC #2
1460 STA coltop+1
1470 BPL loopA
1480 LDX tempx
1490 RTS
1500 :
1510 .writocol
1520 STX tempx
1530 JSR getcoltop
1540 LDX #0
1550 .loopC
1560 LDY #0
1570 .loopD
1580 LDA outbuff,X
1590 STA (coltop),Y
1600 INY
1610 STA (coltop),Y
1620 INY
1630 INX
1640 CPY #8
1650 BNE loopD
1660 LDA coltop
1670 CLC
1680 ADC #800
1690 STA coltop
1700 LDA coltop+1
1710 ADC #2
1720 STA coltop+1
1730 BPL loopC
1740 LDX tempx
1750 RTS
1760 :
1770 .lpix
1780 STX tempy
1790 LDY #127
1800 .loopE
1810 LDA inbuff,Y
1820 AND #&AA
1830 LSR A
1840 TAX
1850 LDA bytab%,X
1860 STA rbuff,Y

1870 DEY
1880 BPL loopE
1890 LDX tempx
1900 RTS
1910 :
1920 .rpix
1930 STX tempx
1940 LDY #127
1950 .loopF
1960 LDA inbuff,Y
1970 AND #855
1980 TAX
1990 LDA bytab%,X
2000 STA rbuff,Y
2010 DEY
2020 BPL loopF
2030 LDX tempx
2040 RTS
2050 :
2060 .movebuffs
2070 LDY #0
2080 .loopG
2090 LDA mbuff,Y
2100 STA lbuff,Y
2110 LDA rbuff,Y
2120 STA mbuff,Y
2130 INY
2140 BPL loopG
2150 RTS
2160 :
2170 .new
2180 LDY #0
2190 .loopN
2200 STY tempy
2210 LDA mbuff,Y
2220 STA tempa
2230 STA aplus
2240 INC aplus
2250 CMP max
2260 BCC chk1
2270 LDA #0
2280 STA aplus
2290 .chk1
2300 LDX lbuff,Y
2310 CPX aplus
2320 BNE chkr
2330 LDA scrtab%,X
2340 ORA outbuff,Y
2350 STA outbuff,Y
2360 JMP nexty
2370 .chkr
2380 LDX rbuff,Y
2390 CPX aplus
2400 BNE chku
2410 LDA scrtab%,X
2420 ORA outbuff,Y
2430 STA outbuff,Y
2440 JMP nexty
2450 .chku
2460 DEY
2470 BPL norap1
2480 LDY #127
2490 .norap1
2500 LDX mbuff,Y
2510 CPX aplus
2520 BNE chkd
2530 LDA scrtab%,X
2540 LDY tempy
2550 ORA outbuff,Y
2560 STA outbuff,Y
2570 JMP nexty
2580 .chkd
2590 LDY tempy
2600 INY
2610 BPL norap2
2620 LDY #0
2630 .norap2
2640 LDX mbuff,Y
2650 CPX aplus
2660 BEQ yes
2670 LDX tempa
2680 .yes
2690 LDA scrtab%,X
2700 LDY tempy
2710 ORA outbuff,Y
2720 STA outbuff,Y
2730 .nexty
2740 INY
2750 BMI done
2760 JMP loopN
2770 .done
2780 RTS
2790 :
2800 .init
2810 LDA max

2820 STA aplus
2830 INC aplus
2840 LDA #0
2850 STA column
2860 .loopR
2870 LDY#0
2880 .loopS
2890 JSR random
2900 LDA scrtab%,X
2910 ASL A
2920 STA outbuff,Y
2930 JSR random
2940 LDA scrtab%,X
2950 ORA outbuff,Y
2960 STA outbuff,Y
2970 INY
2980 BPL loopS
2990 LDX column
3000 JSR writocol
3010 INX
3020 STX column
3030 CPX #80
3040 BNE loopR
3050 RTS
3060 :
3070 .random
3080 LDA rand
3090 AND #&48
3100 ADC #&38
3110 ASL A
3120 ASL A
3130 ROL rand+2
3140 ROL rand+1
3150 ROL rand
3160 LDA rand
3170 AND #15
3180 CMP aplus
3190 BCS random
3200 TAX
3210 RTS
3220 J
3230 NEXT
3240 ENDPROC

2820 STA aplus
2830 INC aplus
2840 LDA #0
2850 STA column
2860 .loopR
2870 LDY#0
2880 .loopS
2890 JSR random
2900 LDA scrtab%,X
2910 ASL A
2920 STA outbuff,Y
2930 JSR random
2940 LDA scrtab%,X
2950 ORA outbuff,Y
2960 STA outbuff,Y
2970 INY
2980 BPL loopS
2990 LDX column
3000 JSR writocol
3010 INX
3020 STX column
3030 CPX #80
3040 BNE loopR
3050 RTS
3060 :
3070 .random
3080 LDA rand
3090 AND #&48
3100 ADC #&38
3110 ASL A
3120 ASL A
3130 ROL rand+2
3140 ROL rand+1
3150 ROL rand
3160 LDA rand
3170 AND #15
3180 CMP aplus
3190 BCS random
3200 TAX
3210 RTS
3220 J
3230 NEXT
3240 ENDPROC

```

Listing 2

```

10 REM Viewsheet graph program
20 REM by Andy Piddidge
30 REM for B/B+/E/M/C
40 REM (c) BAU May 90
50 :
60 HODE0
70 a%=&00800
80 VDU23,224,8E0,&A0,&E0,0,0,0,0,0
90 REPEAT
100 CLS
110 PRINTTAB(12,3)"GRAPH PLOTTING FROM
VIEWSHEET LINKING FILE"
120 PRINT'
130 *CAT V
140 PRINT'
150 INPUT TAB(12)"Linking file number?
VS"L%
160 UNTIL L%>0 AND L%<256
170
180 file$="V.VS"+STR$(L%)
190 PROCdimension(file$)
200 CLS
210 PRINTTAB(15,6)file$
220 PRINTTAB(15,10)"File size: ";xm;"
by ";ym
230 PRINTTAB(15,12)"Max value = ";max
240 PRINTTAB(15,14)"Min value = ";min
250
260 seg=10^(INT(LOG(ABS((max-min)/2.5)))
270 gmax=(INT(max/seg)+1)*seg
280 gmin=(INT(min/seg))*seg
290
300 PRINTTAB(15,18)"Default graph mini
mum = ";gmin;" step size ";seg
310 REPEAT
320 INPUTTAB(15,20)"Preferred graph mi
nimum "m$
330 IF m$="" THEN m=gmin ELSE m=VAL(m$)
)
340 UNTIL m/seg=INT(m/seg) AND m<=gmin
350 gmin=m
360
370 PRINTTAB(15,23)"Default graph maxi
mum = ";gmax
380 REPEAT

```

Continued ►

RISC REVUE

Continued

```

390 INPUTTAB(15,25)"Preferred graph ma
ximum "m$
400 IF m$="" THEN m=gmax ELSE m=VAL(m$
)
410 UNTIL m/seg=INT(m/seg) AND m>gmax
420 gmax=m
430 :
440 VDUS
450 VDU29,120,920;
460 PROCaxes
470 VDU4:PRINTTAB(10,1)"Title?":INPUTT
AB(10,2)"TS:PRINTTAB(10,1)"
480 VDUS
490 CX=OPENIN(file$)
500 :
510 FOR y=1 TO ym
520 MOVE FNx(1),Fny(FNread(1,y))
530 FOR x=1 TO xm
540 val=FNread(x,y)
550 IF val<0 THEN DRAW FNx(x),Fny(val
):PLOT 0,-2,4:VDU224:MOVE FNx(x),Fny(val
)
560 NEXT
570 NEXT
580 :
590 CLOSE#CX
600 VDU4
610 PRINT TAB(0,30)
620 END
630 :
640 DEF PROCdimension(file$)
650 CX=OPENIN(file$)
660 PTR#CX=3
670 ym=BGET #CX
680 xm=BGET #CX
690 PTR #CX=6
700 min=1E38:max=-1E38
710 FOR JZ=1 TO xm*ym
720 INPUT#CX,data
730 IF data<min AND data<0 THEN min=d
ata
740 IF data>max THEN max=data
750 NEXT
760 CLOSE#CX
770 ENDPROC
780 :
790 DEF FNread(x,y)
800 PTR #CX=((y-1)*xm+x-1)*6+6
810 INPUT #CX,data
820 =data
830 :
840 DEFPROCaxes
850 CLS
860 MOVE0,0:DRAW0,-800:DRAW1200,-800
870 FOR NX=1 TO xm
880 MOVE FNx(NX),Fny(gmin)
890 DRAW FNx(NX),Fny(gmin)-10
900 MOVE FNx(NX)-8,Fny(gmin)-20
910 PRINT MID$( "JFMAMJJASOND", (NX-1)*HO
D12+1,1)
920 NEXT NX
930 FOR y=gmin TO gmax STEP seg
940 MOVE 0,Fny(y)
950 DRAW -8,Fny(y)
960 MOVE -120,Fny(y)+16
970 PRINT y
980 NEXT y
990 ENDPROC
1000 :
1010 DEF FNx(x)=x*1020/xm
1020 DEF Fny(y)=(y-gmin)/(gmax-gmin)*80
0-800

```

Listing 3

```

10 REM Create hard disc partition
20 REM by Henk Oostrom
30 REM for B/B+/M with hard disc & Ma
ster 512
40 REM (c) BAU May 90
50 :
60 MODE 3
70 *MOUNT 0
80 *MAP
90 IF VPOS<2 GOTO 140
100 PROctitle
110 PRINTTAB(0,6)"The free space on yo
ur hard disk is fragmented!"
120 PRINT" You have to compact your ha
rd disk first."
130 END
140 PROctitle
150 ON ERROR IF ERR=196 GOTO 180
160 *CDIR DOS
170 GOTO 250
180 PRINT" A DOS+ partition already e
xists. Continue (YES/NO) ? ";
190 INPUT"AS"
200 IF AS="YES" OR AS="yes" GOTO 210 E
lse
210 *DIR $.DOS
220 ON ERROR IF ERR=214 GOTO 260
230 *DELETE DRIVE_C
240 GOTO 260
250 *DIR $.DOS
260 ON ERROR PRINT"Error ";ERR;" in
line ";ERL:END
270 YZ=OPENUP"LEN_DRV_C"
280 PRINT #YZ,HZ
290 CLOSE#YZ
300 DIM Naam 10,Blok 30
310 AX=871
320 XZ=Blok MOD 256
330 YZ=Blok DIV 256
340 CALL &FFF1
350 FX=1Blok
360 GX=FX DIV 1024
370 GX=GX DIV 1024
380 PRINT" There are ";GX;" Mbytes fr
ee on your hard disk."
390 IF GX<5 PRINT" This is not enough
for a DOS+ partition!":END
400 PRINT" Enter size DOS+ partition
(in Mbytes): ";
410 INPUT"HX"
420 IF HX<5 OR HX>GX PRINT"Size must b
e between 5 and ";GX;" Mbytes!":PRINTTAB
(15,24)"PRESS A KEY TO CONTINUE";:HX=G
ET:PROctitle:GOTO 400
430 YZ=OPENUP"LEN_DRV_C"
440 PRINT #YZ,HZ
450 CLOSE#YZ
460 LX=(HX*512-2)*2048+(HZ+17)*1024
470 RX=FX-LX
480 PROctitle
490 PRINT" Creating file DRIVE_C . .
."
500 $Naam="DUMMY"
510 AX=7
520 XZ=Blok MOD 256
530 YZ=Blok DIV 256
540 ?Blok=Naam MOD 256
550 ?Blok=?Naam DIV 256
560 ?Blok=?2=0
570 ?Blok=?8=8FFFFFFF
580 ?Blok=?10=0
590 ?Blok=?14=R%

```

Listing 4

```

10 REM Recover hard disc
20 REM by Henk Oostrom
30 REM for B/B+/M with hard disc
40 REM (c) BAU May 90
50 :
60 MODE 3
70 *MOUNT 0
80 *MAP
90 IF VPOS>2 THEN PROctitle:PRINTTAB(
0,6)"The free space on your hard disk is
fragmented!":PRINT" You have to compact
your hard disk first!":END
100 PROctitle
110 ?DIR $.DOS
120 ON ERROR PRINT"Error ";ERR;" in
line ";ERL:END
130 DIM Naam 10;DIM Blok 30
140 AX=?B71:XZ=Blok MOD 256:YZ=Blok DIV
256
150 CALL &FFF1
160 FX=!Blok:GX=FX DIV 1024:GX=GX DIV
1024
170 YZ=OPENIN"LEN_DRV_C":INPUT #YZ,HZ:
CLOSE#YZ
180 LX=(HX*512-4)*2048+(HZ+17)*1024
190 RX=FX-LX
200 PROctitle
210 PRINT" Restoring file DRIVE_C . .
."
220 $Naam="DUMMY"
230 AX=?X:XZ=Blok MOD 256:YZ=Blok DIV 2
56
240 ?Blok=Naam MOD 256
250 ?Blok=?Naam DIV 256
260 ?Blok=?2=0
270 ?Blok=?8=8FFFFFFF
280 ?Blok=?10=0
290 ?Blok=?14=R%
300 CALL&FFDD
310 $Naam="DRIVE_C"
320 ?Blok=Naam MOD 256
330 ?Blok=?Naam DIV 256
340 ?Blok=?2=0
350 ?Blok=?8=8FFFFFFF
360 ?Blok=?10=0
370 ?Blok=?14=L%
380 CALL&FFDD
390 ON ERROR OFF
400 *DELETE DUMMY
410 END
420 DEF PROctitle
430 CLS
440 PRINT STRINGS(60,"=")
450 PRINTTAB(6)"DOS+ HARD DISK PARTITI
ON REPAIR PROGRAM version 1.1"
460 PRINTTAB(6)"(C) HENK OOSTROM, ZO
ETERMEER NETHERLANDS, 1989"
470 PRINT STRINGS(60,"=")
480 ENDPROC

```

NEW MODES

Listing 1

```

10 REM >NM1
20 REM OS_ReadModeVariable
30 REM by David Acton
40 REM for Archimedes only
50 REM (c) BAU May 1990
60 :
70 MODE 12
80 REPEAT
90 COLOUR 6
100 INPUT"Enter a screen mode number:
"mode%
110 COLOUR 7
120 PRINT" Mode ";mode%
130 SYS "OS_CheckModeValid",mode% TO
realmode%:ok%
140 IF (ok% AND 2)>0 THEN
150 IF realmode%<mode% PRINT" (Mode i
s invalid - mode ";realmode%;" will be u
sed instead)"
160 ENDIF
170 mode%=FNreadmodevar(0)
180 PRINT
190 IF (modetype% AND 1)=0 PRINT"Graph
ics mode" ELSE PRINT"Non-graphics mode"
200 IF (modetype% AND 2)=0 PRINT"Telet
ext mode"
210 IF (modetype% AND 4)=0 PRINT"Gap m
ode" ELSE PRINT"Non-gap mode"

```

Listing 2

```

10 REM >NM2
20 REM OS_ReadVduVariables
30 REM by David Acton
40 REM for Archimedes only
50 REM (c) BAU May 1990
60 :
70 MODE 15
80 DIM tx &100
90 PRINT"Current mode is ";MODE

```

Listing 3

```

10 REM >NM3
20 REM Testcard
30 REM by David Acton
40 REM for Archimedes only
50 REM (c) BAU May 1990
60 :
70 DIM vars% &10

```

```

80 SYS "OS_SVINumberFromString",,"OS_
CheckModeValid" TO swicm%
90 REPEAT
100 MODE 0
110 PRINT"Modes available: "
120 FOR ix=0 TO 255
130 SYS swicm%,ix TO ok%
140 IF (ok% AND 2)=0 PRINT ix,;
150 NEXT
160 PRINT"
170 REPEAT
180 INPUT"Which mode? "mode%
190 SYS swicm%,mode% TO ok%
200 UNTIL (ok% AND 2)=0
210 MODE mode%
220 OFF
230 modeflags=FNmodevar(0)
240 columns=FNmodevar(1)+1
250 rows=FNmodevar(2)+1
260 cols=FNmodevar(3)+1
270 IF cols=64 colours=256 ELSE colo
urs=cols%
280 xpix=FNmodevar(11)+1
290 ypix=FNmodevar(12)+1
300 xeix=FNmodevar(4)
310 yeix=FNmodevar(5)
320 xcharsize=FNmodevar(162)<<xeig%
330 ycharsize=FNmodevar(163)<<yieg%

```

Continued

NEW MODES

Continued

```

340 xcharspace%=Fmodevar(164)<<xeig%
350 ycharspace%=Fmodevar(165)<<yeig%
360 maxpixx=xpixx<<xeig%
370 maxpixy=yypixx<<yeig%
380 :
390 IF (modeflags% AND 1)=1 THEN
400 r%=rows%/2
410 PROCcentre("Mode "+STR$(MODE),r%-2
)
420 PROCcentre("Non-graphics",r%+2)
430 ELSE
440 csizex=42
450 xcentx=maxpixx%/2
460 ycentx=maxpixy%/2
470 xsqsz=(xcentx DIV csizex%)+2
480 ysqsz=(ycentx DIV csizex%)+2
490 cx=0
500 FOR x%=xsqsz TO xsqsz
510 FOR y%=ysqsz TO ysqsz
520 ox=xcentx+x%*csizex%
530 oy=ycentx+y%*csizex%
540 GCOL cx
550 cx=(cx+1) MOD cols%
560 CIRCLE FILL ox,oy,csizex%*2/3
570 GCOL 0
580 CIRCLE ox,oy,csizex%*2/3
590 NEXT
600 NEXT
610 PROCbox(0,"Mode "+STR$(MODE),"")
620 PROCbox(1,"Pixels:",STR$(xpixx%)+
" "+STR$(ypixx%))
630 PROCbox(2,"Text:",STR$(columns%)+
" "+STR$(rows%))
640 PROCbox(3,"Colours:",STR$(colours%
))
650 ENDIF
660 wait=GET
670 UNTIL FALSE
680 END
690 :
700 DEF PROCcentre(t$,y%)
710 PRINTTAB((columns%-LEN(t$))/2,y%)t
$
720 ENDPROC
730 :
740 DEF PROCbox(n%,t$,t2%)
750 boxheight%=maxpixx%/8
760 boxwidth%=maxpixx%*0.7
770 boxox%=xcentx-boxwidth%/2
780 boxoy%=maxpixx%-(n%+1)*(maxpixx%/4
)+maxpixx%/16
790 GCOL 0
800 RECTANGLE FILL boxox%,boxoy%,boxwi
dth%,boxheight%
810 CASE colours% OF
820 WHEN 2:GCOL 1
830 WHEN 4:GCOL 3
840 WHEN 16:GCOL 7
850 WHEN 256:GCOL 63 TINT 192
860 ENDCASE
870 RECTANGLE boxox%,boxoy%,boxwidth%,
boxheight%
880 VDU 5
890 IF t2%="" THEN

```

```

900 x%=boxox%+boxwidth%/2-(LEN(t1$)*x%
harsize%)/2
910 y%=boxoy%+boxheight%/2
920 MOVE x%,y%+ycharsize%/2-1
930 PRINTt1$
940 ELSE
950 x%=boxox%+boxwidth%/2-(LEN(t1$)*x%
harsize%)/2
960 y%=boxoy%+boxheight%/2
970 MOVE x%,y%+ycharsize%*1.25-1
980 PRINTt1$
990 x%=boxox%+boxwidth%/2-(LEN(t2$)*x%
harsize%)/2
1000 MOVE x%,y%-ycharsize%*0.25-1
1010 PRINTt2$
1020 ENDIF
1030 VDU 4
1040 OFF
1050 ENDPROC
1060 :
1070 DEF Fmodevar(n%)
1080 lvars%=n%
1090 vars%14=-1
1100 SYS "OS_ReadVduVariables",vars%,va
rs%
1110 !=lvars%

```

Listing 4

```

10 REM >NM4
20 REM Mode creator
30 REM by David Acton
40 REM for Archimedes only
50 REM (c) BAU May 1990
60 :
70 MODE 0
80 DIM code% 81000
90 REPEAT
100 INPUT"Colours (2,4,16 or 256): "co
lours%
110 CASE colours% OF
120 WHEN 2:basemode%=0:pixelsperbyte%=
8:k%=19
130 WHEN 4:basemode%=8:pixelsperbyte%=
4:k%=11
140 WHEN 16:basemode%=12:pixelsperbyte
%=2:k%=7
150 WHEN 256:basemode%=15:pixelsperbyt
e%=1:k%=5
160 OTHERWISE
170 basemode%=-1
180 ENDCASE
190 UNTIL basemode%<0-1
200 REPEAT
210 INPUT"Columns (8-100): "maxcol%
220 UNTIL maxcol%>=8 AND maxcol%<=100
230 REM Round number of columns up to
a multiple of 4...
240 maxcol%=(maxcol%+3) AND (NOT 3))
250 hpixx%=8*maxcol%
260 REPEAT

```

```

270 INPUT"Rows (8-40): "maxrow%
280 UNTIL maxrow%>=8 AND maxrow%<=40
290 REPEAT
300 PROCins("123")
310 INPUT"Number of new mode (30-127):
"newmode%
320 UNTIL newmode%>=30 AND newmode%<=1
27
330 vpixx%=8*maxrow%
340 :
350 hcycle%=1024
360 vcycle%=320
370 hsyncwidth%=58
380 vsyncwidth%=0
390 remainh%=hcycle%-hpixx%
400 hbordstart%=64+remainh%/4
410 hdispend%=hboardstart%+remainh%/4
420 hdispend%=hdispend%+hpixx%
430 hbordend%=hdispend%+remainh%/4
440 remainv%=vcycle%-vpixx%
450 vbordstart%=10+remainv%/4
460 vdispend%=vbordstart%+remainv%/4
470 vdispend%=vdispend%+vpixx%
480 vbordend%=vdispend%+remainv%/4
490 screensize%=(vpixx%*hpixx%) DIV pix
elsperbyte%+8FFF AND 8FFFF000
500 IF colours%=256 colours%=64
510 :
520 titles="BAUModes"
530 Link=14:pc=15
540 FOR pass%=4 TO 6 STEP 2
550 P%0
560 OX=code%
570 OPT pass%
580 .module
590 EQU 0
600 EQU 0
610 EQU 0
620 EQU service
630 EQU title
640 EQU help
650 EQU 0
660 EQU 0
670 EQU 0
680 EQU 0
690 EQU 0
700 :
710 .title
720 EQU "BAUModes"
730 EQU 0
740 ALIGN
750 .help
760 EQU "BAUModes"+CHR$(9)+"1.00 "+"H
IDS(TIMES,5,11)+"")
770 EQU 0
780 ALIGN
790 :
800 .service
810 CMP R1,#850
820 BNE notnewmode
830 CMP R2,#newmode%
840 BNE notnewmode
850 MOV R1,#0
860 ADR R3,vidclist
870 ADR R4,wslst

```

```

880 .notnewmode
890 MOV pc,Link
900 :
910 .vidclist
920 EQU 0
930 EQU basemode%
940 EQU ((%100000000)<<24)+((hcycle%-
2)/2)<<14)
950 EQU ((%10000100)<<24)+((hsyncwid
th%-2)/2)<<14)
960 EQU ((%10001000)<<24)+((hboardsta
rt%-1)/2)<<14)
970 EQU ((%10001100)<<24)+((hdispsa
rt%-k%)/2)<<14)
980 EQU ((%10010000)<<24)+((hdispend
%-k%)/2)<<14)
990 EQU ((%10010100)<<24)+((hboardend
%-1)/2)<<14)
1000 EQU ((%10100000)<<24)+((vcycle%<<1
4)
1010 EQU ((%10100100)<<24)+((vsyncwid
th%<<14)
1020 EQU ((%10101000)<<24)+((vbordstar
t%-1)<<14)
1030 EQU ((%10101100)<<24)+((vdispsa
rt%-1)<<14)
1040 EQU ((%10110000)<<24)+((vdispend%
-1)<<14)
1050 EQU ((%10110100)<<24)+((vbordend%
-1)<<14)
1060 EQU -1
1070 :
1080 .wslst
1090 EQU 0
1100 EQU basemode%
1110 EQU 0:EQU 0
1120 EQU 1:EQU maxcol%-1
1130 EQU 2:EQU maxrow%-1
1140 EQU 3:EQU colours%-1
1150 EQU 4:EQU 1
1160 EQU 5:EQU 2
1170 EQU 6:EQU hpixx% DIV pixelsperbyt
e%
1180 EQU 7:EQU screensize%
1190 EQU 11:EQU hpixx%-1
1200 EQU 12:EQU vpixx%-1
1210 EQU -1
1220 J:NEXT pass%
1230 :
1240 PRINT"Module assembled in: "P%; " b
ytes"
1250 PROCins("BAUModes")
1260 INPUT"Save as: "save$
1270 SYS "OS_File",10,save$,8FFA,,code%
,0%
1280 OSCLI("RLOAD "+save$)
1290 MODE newmode%
1300 END
1310 :
1320 DEF PROCins(is)
1330 FOR ix=1 TO LEN(is)
1340 SYS "OS_Byte",138,0,ASCID$(is,ix)
1350 NEXT
1360 ENDPROC

```

STRUM

Listing 1

```

10 REM STRUM
20 REM by Mike Smith
30 REM for B/B/H/M/C
40 REM (c) BAU May 1990
50 :
60 *TV255,1
70 MODE7
80 PRINTCHR$141;CHR$132;CHR$157;CHR$1
31:SPC(4);"STRUM by Mike Smith (c)1989";
SPC(4)
90 PRINTCHR$141;CHR$132;CHR$157;CHR$1
31:SPC(4);"STRUM by Mike Smith (c)1989";
SPC(4)
100 *FX225,200
110 *FX226,210
120 *FX227,220
130 *FX228,230
140 *FX11,0
150 DIM n$(10),np$(10),c$(6),p$(9,7),
ins$(9),ex$(9,12),dx$(50),pet$(11),seq$(9),
rhythm$(9),rseq$(9),racc$(9),kb 512,kc
25
160 FOR ix=0 TO 9:seq$(ix)=STRINGS(32,
""):rseq$(ix)=STRINGS(32,"0"):racc$(ix)
=STRINGS(32,"/"):NEXT
170 AF=0:BX=0:CX=10:DX=1:EX=0:FX=1:GX=
0:HX=1:IX=1:JX=0:KX=0:LX=0:MX=0:NX=0:OX=
0:PX=1:QX=512:RX=0:SX=0:TX=0:UX=0:VX=0:W
X=0:ZX=0:dx(1)=0:name$="newsong":cs(10)=
""
180 chz=1:maxx%=8:tempo%=16:intx%=0:sync
x%=0:flushx%=810:randx%=0:durx%=8:tranx%=0:ct
ranx%=0:ktanx%=0:btanx%=91:stictx%=0:Li=
1:LnX=0:LcX=0:LpX=0:LastpanX=0:softx%=16
190 notes$="c d ef g a bKc D EF G A Bk"
200 par$="nm,,sldhcavgfz kxj;:-NM<SLD

```

```

HCAVGfz KJX"
210 Keyboard$=CHR$(9)+"1q2w4r5t6yui9op
-a"CL"+CHR$(139
220 RESTORE 230:ix=0:REPEAT ix=ix+1:RE
AD kc:ix:UNTIL ix=25
230 DATA 97,49,17,50,34,35,19,52,20,36
,53,69,54,22,38,39,55,56,24,72,25,57,121
,41,58
240 PROCdefaultdrums
250 PROCdefaultchords
260 PROCdefaultrhythms
270 PROCdefaultinstruments
280 PROCinstrument(IX)
290 ENVELOPE 3,1,0,0,0,0,0,0,126,-10,0
,-5,126,104
300 ENVELOPE 4,1,0,0,0,0,0,0,126,-10,0
,-5,112,88
310 ENVELOPE 5,1,0,0,0,0,0,0,30,-10,0,0
,-1,120,80
320 ENVELOPE 6,1,0,0,0,0,0,0,30,-10,0,0
,-1,104,64
330 ENVELOPE 7,129,-2,0,0,126,0,0,0,0,
0,0,0,0
340 ENVELOPE 8,129,2,0,0,126,0,0,0,0,0,
0,0,0
350 ENVELOPE 9,1,0,0,0,0,0,0,126,-10,0
,-1,126,104
360 ENVELOPE 10,1,0,0,0,0,0,0,126,-10,0
,-1,112,88
370 ENVELOPE 11,6,-1,-1,-1,1,1,120,-5
,0,-10,120,80
380 Input$="abcdefgKcDEFgK/vmH<s123
456789 /()"+CHR$(127
390 ON ERROR GOTO 1700
400 VDU28,0,24,39,2,23,1,0;0;0;0;
410 *FX202,32

```

```

420 *FX4,0
430 :
440 CLS:PRINT"CHR$129;" MENU: En
ter selection..."
450 PRINTCHR$134;"<A> "CHR$131;"Quit
program"
460 PRINTCHR$134;"<C> "CHR$131;"ente
r or edit Chord sequence"
470 PRINTCHR$134;"<D> "CHR$131;"ente
r or edit Drum sequence"
480 PRINTCHR$134;"<P> "CHR$131;"Play
chords, drums, or keyboard"
490 PRINTCHR$134;"<Q> "CHR$131;"reco
rd Keyboard sequence"
500 PRINTCHR$134;"<E> "CHR$131;"repl
ay or Edit keyboard sequence"
510 PRINTCHR$134;"<L> "CHR$131;"Load
"
520 PRINTCHR$134;"<S> "CHR$131;"Save
"
530 PRINTCHR$134;"<I> "CHR$131;"defa
ult Instruments"
540 PRINTCHR$134;"<H> "CHR$131;"defa
ult drum patterns"
550 PRINTCHR$134;"<R> "CHR$131;"defa
ult chord Rhythms"
560 PRINTCHR$134;"<F> "CHR$131;"edit
fkey chords"
570 PRINT"CHR$129;"<ESCAPE> to return
to Menu":PROCfkeys
580 :
590 REPEAT ks=GET$
600 IF ks="C" PROCedit(0)
610 IF ks="D" PROCedit(1)
620 IF ks="P" ADR R3,PROCplay
630 IF ks="K" AX=1:GX=1:QX=512:PROCpla
y

```

```

640 IF ks="E" AX=2:GX=1:PROCplay
650 IF ks="L" PROCload:PROCfkeys
660 IF ks="S" PROCsave
670 IF ks="I" PROCdefaultinstruments:P
ROCFkeys
680 IF ks="R" PROCdefaultrhythms:PROCF
keys
690 IF ks="M" PROCdefaultdrums:PROCFke
ys
700 IF ks="F" PROCdefchord
710 UNTIL ks="Q"
720 :
730 VDU26,12,23,1,1;0;0;0;
740 *FX4,0
750 *FX12,0
760 END
770 :
780 DEF PROCchord(cs)
790 LOCAL rx
800 rx=INSTR(note$,LEFT$(cs,1))
810 IF rx>13 EX=1:rx=rx-13 ELSE EX=2
820 IF rx=13 UX=VAL(RIGHT$(cs,1)):ENDP
ROC ELSE UX=0
830 IF INSTR(cs,"#") rx=rx+1
840 IF INSTR(cs,"v") rx=rx-1
850 rx=1+rx*4:pX(0,0)=rx:pX(0,1)=rx:pX
(0,2)=rx+16:pX(0,3)=rx+28:pX(0,4)=rx+48:
pX(0,5)=rx+64:pX(0,6)=rx+76:pX(0,7)=rx+9
6
860 IF INSTR(cs,"m") OR INSTR(cs,"-")
pX(0,2)=pX(0,2)-4:pX(0,5)=pX(0,5)-4
870 IF INSTR(cs,"7") OR INSTR(cs,"11")
pX(0,4)=pX(0,4)-8:pX(0,7)=pX(0,7)-8
880 IF INSTR(cs,"H7") pX(0,4)=pX(0,4)-
4:pX(0,7)=pX(0,7)-4

```

Continued

STRUM

◀ Continued

```

890 IF INSTR(c$, "s") pX(0,3)=pX(0,3)+4
: pX(0,6)=pX(0,6)+4
900 IF INSTR(c$, "s") pX(0,3)=pX(0,3)-4
: pX(0,6)=pX(0,6)-4
910 IF INSTR(c$, "s") pX(0,2)=pX(0,2)+4
: pX(0,5)=pX(0,5)+4
920 IF INSTR(c$, "6") pX(0,3)=pX(0,3)+8
: pX(0,6)=pX(0,6)+8
930 IF INSTR(c$, "9") OR INSTR(c$, "13")
pX(0,4)=pX(0,4)+8: pX(0,7)=pX(0,7)+8
940 IF INSTR(c$, "11") pX(0,2)=pX(0,2)+4
: pX(0,5)=pX(0,5)+4
950 IF INSTR(c$, "13") pX(0,3)=pX(0,3)+8
: pX(0,6)=pX(0,6)+8
960 ENDPROC
970 :
980 DEF PROCstrum
990 LOCAL nX, noX, noteX: noteX=4-intX*4
1000 IF RX OR strictX noX=1 ELSE noX=RN
D(4)
1010 REPEAT nX=nX+1: BX=BXMODQX+1
1020 REPEAT PROCpar(INKEY(0)): UNTIL ZX=
0
1030 IF RX noteX=VAL(MID$(rseq$(RX), nX,
1)): EX=VAL(MID$(racc$(RX), nX, 1)) ELSE IF
intX noteX=noteX+intX ELSE noteX=noteX+
SGN(RND)*RND(2)
1040 IF noteX>7 OR noteX<0 noteX=4-intX
*3
1050 IF randX=0 REPEAT UNTIL TIME>temp
oX: TIME=0
1060 IF nX=1 AND JX PRINTc$(JX); " "; EL
SE IF nX=1 PRINTc$(cX); " ";
1070 IF (nX-1)MODnoX=0 AND HX SOUND Fnr
est+syncX+flushX+chX, EX, pX(UX, noteX)+tra
nX+ctranX, durX: chX=chXMOD(3-GX)+1
1080 IF (nX-1)MODnoX=0 AND HX AND syncX
>0 SOUND Fnr+syncX+flushX+chX, EX, pX(U
X, noteXMOD7+1)+ctranX+ctranX, durX: chX=chX
MOD(3-GX)+1
1090 IF (nX-1)MODnoX=0 AND HX AND syncX
>1 SOUND Fnr+syncX+flushX+chX, EX, pX(U
X, noteXMOD6+2)+ctranX+ctranX, durX: chX=chX
MOD(3-GX)+1
1100 IF DX PROCdrum(MID$(perc$(nX), 1))
1110 UNTIL nX=maxX
1120 IF randX REPEAT UNTIL TIME>tempoX
*maxX: TIME=0
1130 ENDPROC
1140 :
1150 DEF Fnr+est
1160 EX=(noteX=0 OR c$(cX)="") AND JX=0
) OR c$(JX)="")*81000
1170 :
1180 DEF PROCparmenu
1190 FFX202, 48
1200 X=POS: YX=VPOS: VDU20, 0, 16, 39, 2
1210 CLS: PRINT CHR$129; "Playing"; CHR$13
5; names; CHR$129; "<C>P" env <TAB> rhythm"
"
1220 PRINTCHR$134; "<C>"; CHR$131; "tem
po"; TAB(30, 3); CHR$129; tempo*maxX
1230 PRINTCHR$134; "<C>"; CHR$131; "bea
ts per chord"; TAB(30, 4); CHR$129; maxX
1240 PRINTCHR$134; "<C>"; CHR$131; "sus
tain"; TAB(30, 5); CHR$129; durX
1250 PRINTCHR$134; "<C>"; CHR$131; "sof
ter/louder"; TAB(30, 6); CHR$129; softX
1260 PRINTCHR$134; "<C>"; CHR$131; "arp
eggio"; CHR$131; "chords"
1270 PRINTCHR$134; "<C>"; CHR$131; "fal
ling"; CHR$131; "rising"; CHR$131; "pitch"
1280 PRINTCHR$134; "<C>"; CHR$131; "var
iable pitch and timing"
1290 PRINTCHR$134; "<C>"; CHR$131; "str
ict timing"
1300 PRINTCHR$134; "<C>"; CHR$131; "tra
nspose"; CHR$129; tranXDIV4; TAB(21, 11); CHR$
130; "C"; "ctranXDIV48; TAB(27, 11); "K"; "ktra
nXDIV48; TAB(32, 11); "B"; "btranX-187)DIV48
1310 PRINTCHR$134; "<C>"; CHR$131; "Loo
p start/end"
1320 PRINTCHR$134; "<C>"; CHR$131; "Sto
p"; CHR$134; "<C>"; CHR$131; "kbd"; CHR$134; "<
C>"; CHR$131; "Chord"; CHR$134; "<C>"; CHR$1
31; "Drum";
1330 IF intX=0 PRINTTAB(7, 9); CHR$129; EL
SE IF intX=1 PRINTTAB(7, 10); CHR$129; TAB(1
5, 8); CHR$131; ELSE PRINTTAB(15, 8); CHR$129;
1340 IF syncX=8200 PRINTTAB(16, 7); CHR$12
9; ELSE IF flushX=810 PRINTTAB(7, 7); CHR$1
29;
1350 IF strictX PRINTTAB(7, 10); CHR$129;
ELSE PRINTTAB(7, 10); CHR$131;
1360 IF ZX PRINTTAB(7, 13); CHR$129;
1370 IF GX PRINTTAB(16, 13); CHR$129;
1380 IF HX PRINTTAB(24, 13); CHR$129;
1390 IF DX PRINTTAB(34, 13); CHR$129;
1400 VDU20, 0, 19, 39, 17, 31, XX, YX
1410 ENDPROC
1420 :
1430 DEF PROCplay
1440 LOCAL cX, tcX, LX, ppX, tppX, pLX
1450 CLS: PROCkeys: PROCparmenu: BX=0: cX=
9: ppX=0: FFX4, 1
1460 IF AX=1 PROCintro: FFX15, 0
1470 REPEAT
1480 REPEAT cX=FNinc: tcX=cX
1490 IF c$(cX)="(" LX=LX+1: nX(LX)=cX
1500 IF c$(cX)=")" cX=nX(LX): nX(LX)=tcX
: LX=LX+(cX=tcX)
1510 UNTIL c$(cX) < " (" AND c$(cX) > ")"
1520 REPEAT ppX=FNinc: tppX=ppX
1530 IF dX(ppX)=10 pLX=pLX+1: npX(pLX)=p
pX
1540 IF dX(ppX)=11 ppX=npX(pLX): npX(pLX
)=tppX: pLX=pLX+(ppX=tppX)
1550 UNTIL dX(ppX) < 10 AND dX(ppX) > 11
1560 IF KX PROCperc(KX) ELSE PROCperc(d
X(ppX))
1570 IF JX PROCchord(c$(JX)) ELSE IF c$(
cX) < " (" PROCchord(c$(cX))
1580 PROCstrum
1590 UNTIL FALSE
1600 ENDPROC
1610 :
1620 DEF FNinc
1630 IF cX=0: cX=1
1640 IF cX=1: cX=2
1650 :
1660 DEF FNincp
1670 IF ppX=0: PP=1
1680 IF ppX=1: PP=2
1690 :
1700 ON ERROR OFF
1710 IF ERR<17 REPORT: PRINT " at line "
; ERL: CLOSE#0: PRINTCHR$129; "PRESS ANY KEY
TO CONTINUE": KX=GET
1720 IF ERR=17 AND AX=1 GX=BX+maxX-nX+(
CX-cX-1)*maxX: REPEAT BX=BX+1: kb?BX=0: UNT
IL BX>GX
1730 IF ERR=17 VX=0: VX=0
1740 GOTO 390
1750 :
1760 DEF PROCpar(KX)
1770 IF GX PROCkbd(KX)
1780 IF AX=2 AND BX=GX AND INKEY(-2) AX
=1: GX=512
1790 IF KX=-1 ENDPROC
1800 IF KX=135 VX=(VX+1)MOD2: IF VX=0 PR
OCparmenu: ENDPROC ELSE IF KX=135 PROCp
armenu: ENDPROC
1810 IF KX=9 WX=(WX+1)MOD2: IF WX=0 PR
OCparmenu: ENDPROC ELSE IF KX=9 PROCrhyth
m: ENDPROC
1820 IF KX>229 AND GX=0 LX=kX-230: PROCi
nstrument(LX) ELSE IF KX>229 FX=kX-230: PR
OCinstrument(FX)
1830 IF KX>219 AND KX<230 RX=kX-210: PR
OCrhythm
1840 IF KX>209 AND KX<220 JX=kX-210: PR
OCchrd
1850 IF KX>199 AND KX<210 KX=kX-200
1860 IF VX PROCvaryenv(VX): ENDPROC
1870 IF WX PROCvaryrhythm(KX): ENDPROC
1880 IF KX>199 ENDPROC ELSE KX=CHR$KX
1890 X=POS: YX=VPOS: VDU20, 0, 16, 39, 2
1900 IF KX=136 OR KX=137 PROCtempo(KX)
1910 TX=(INSTR(par$(KX), "ks"))MOD21: IF TX
ON TX GOSUB 1930, 1930, 1940, 1940, 1950, 1950, 1
960, 1960, 1970, 1980, 1990, 2000, 2010, 2020, 2
030, 2040, 2050, 2060, 2070, 2080
1920 VDU20, 0, 19, 39, 17, 31, XX, YX: ENDPROC
1930 PROCdrum(kX): RETURN
1940 PROCmax(kX): RETURN
1950 PROCsoft(kX): RETURN
1960 PROCtran(kX): RETURN
1970 syncX=8200-8100*GX: flushX=810: rand
X=0: PRINTTAB(7, 7); CHR$131; TAB(16, 7); CHR$12
9; RETURN
1980 syncX=0: flushX=810: randX=0: PRINTTA
B(7, 7); CHR$129; TAB(16, 7); CHR$131: RETURN
1990 intX=0: syncX=0: flushX=0: randX=1: PR
INTTAB(7, 7); CHR$131; TAB(16, 7); CHR$131; TAB
(7, 9); CHR$129; TAB(7, 8); CHR$131; TAB(15, 8); CHR
$131; RETURN
2000 intX=1: randX=0: PRINTTAB(7, 9); CHR$13
1; TAB(7, 8); CHR$131; TAB(15, 8); CHR$129; RET
URN
2010 intX=-1: randX=0: PRINTTAB(7, 9); CHR$1
31; TAB(7, 8); CHR$129; TAB(15, 8); CHR$131; RET
URN
2020 strictX=(strictX+1)MOD2: IF strictX
PRINTTAB(7, 10); CHR$129; RETURN ELSE PRIN
TTAB(7, 10); CHR$131; RETURN
2030 ZX=(ZX+1)MOD2: IF ZX PRINTTAB(7, 13)
CHR$129; RETURN ELSE PRINTTAB(7, 13); CHR$1
31; RETURN
2040 GX=(GX+1)MOD2: IF GX=0 PRINTTAB(16,
13); CHR$131; syncX=syncX+2: RETURN ELSE PR
INTTAB(16, 13); CHR$129; syncX=syncXDIV2: RE
TURN
2050 HX=(HX+1)MOD2: IF HX PRINTTAB(24, 13)
CHR$129; RETURN ELSE PRINTTAB(24, 13); CHR
$131; RETURN
2060 DX=(DX+1)MOD2: IF DX PRINTTAB(34, 13)
CHR$129; RETURN ELSE PRINTTAB(34, 13); CHR
$131; RETURN
2070 IF AX=2 SX=BX: RETURN
2080 IF AX=2 OX=BX: PROCloop: RETURN
2090 :
2100 DEF PROCtempo(tX)
2110 IF tX<136 tempoX=tempoX-1+9*INKEY(
-1): IF tempoX<1 tempoX=1
2120 IF tX=137 tempoX=tempoX+1-9*INKEY(
-1)
2130 PRINTTAB(31, 3); tempoX*maxX; " "
2140 ENDPROC
2150 :
2160 DEF PROCdrum(dX)
2170 IF INSTR("nn", dX) durX=durX-1: IF d
urX<1 durX=1
2180 IF INSTR("mm", dX) durX=durX+1: IF
durX>255 durX=255
2190 PRINTTAB(31, 5); durX; " "
2200 ENDPROC
2210 :
2220 DEF PROCsoft(sX)
2230 IF INSTR("ss", sX) softX=softX+8: PR
OCenv
2240 IF INSTR("ll", sX) softX=softX-8: PR
OCenv
2250 PRINTTAB(31, 6); softX; " "
2260 ENDPROC
2270 :
2280 DEF PROCmax(mX)
2290 IF INSTR("<,>", mX) maxX=maxX-1: IF m
axX<1 maxX=1
2300 IF INSTR(">,<", mX) maxX=maxX+1
2310 PRINTTAB(31, 3); tempoX*maxX; " TAB
(31, 4); maxX; " "
2320 ENDPROC
2330 :
2340 DEF PROCtran(tX)
2350 IF tX="d" tranX=tranX-4: IF tranX<0
tranX=0
2360 IF tX="h" tranX=tranX+4: IF tranX>4
8 tranX=48
2370 IF tX="b" ktranX=ktranX-48*GX: ctra
nX=ctranX-48*HX*(1-GX): btranX=btranX-48*
DX*(1-HX)*(1-GX)
2380 IF ctranX<0 ctranX=0
2390 IF ktranX<0 ktranX=0
2400 IF btranX<0 btranX=0
2410 IF tX="H" ktranX=ktranX+48*GX: ctra
nX=ctranX+48*HX*(1-GX): btranX=btranX+48*
DX*(1-HX)*(1-GX)
2420 IF ctranX>144 ctranX=144
2430 IF ktranX>144 ktranX=144
2440 IF btranX>187 btranX=187
2450 PRINTTAB(18, 11); tranXDIV4; " TAB(2
4, 11); ctranXDIV48; " TAB(29, 11); ktranXDI
V48; " TAB(34, 11); (btranX-187)DIV48; "
2460 ENDPROC
2470 :
2480 DEF PROCkbd(bX)
2490 NX=INSTR(Keyboards$, CHR$bX)
2500 IF NX LX=kX+NX: kX=-1 ELSE NX=INKEY
(-LX)
2510 IF AX=1 OR (AX=2 AND NX<0) kb?BX=
NX
2520 IF AX=2 AND bX=127 kb?BX=0
2530 IF AX=2 NX=kb?BX
2540 IF NX=-1 OR NX=255 ENDPROC
2550 IF NX=0 SOUND 81013, 0, 0, -1: ENDPROC
2560 SOUND 813, 11, 1+tranX+ktranX+4*NX, -
1
2570 ENDPROC
2580 :
2590 DEF PROCintro
2600 FOR iX=0 TO 4
2610 SOUND 810, 3, 0, 1
2620 REPEAT UNTIL TIME>tempoX*maxX: TIM
E=0
2630 NEXT
2640 ENDPROC
2650 :
2660 DEF PROCloop
2670 REPEAT BX=SX-1
2680 REPEAT BX=BXMODQX+1
2690 REPEAT UNTIL TIME>tempoX: TIME=0
2700 PROCkbd(INKEY(0))
2710 UNTIL BX=0X OR INKEY(-99)
2720 UNTIL INKEY(-99)
2730 ENDPROC
2740 :
2750 DEF PROCslenu
2760 VDU23, 1, 1, 0, 0, 0, 0
2770 PRINTCHR$134; "<A>"; CHR$131"ALL"
2780 PRINTCHR$134; "<A>"; CHR$131"Chords"
2790 PRINTCHR$134; "<A>"; CHR$131"Drums"
2800 PRINTCHR$134; "<A>"; CHR$131"Keyboar
d"
2810 PRINTCHR$134; "<A>"; CHR$131"Instrum
ents"
2820 PRINTCHR$134; "<A>"; CHR$131"Rhyth
as"
2830 PRINTCHR$134; "<A>"; CHR$131"O.S. Co
mand"
2840 VDU20, 0, 24, 39, 13, 14
2850 REPEAT REPEAT DS=GETS: UNTIL INSTR(
"ACDKIR", DS): IF DS="*" PROCos
2860 UNTIL INSTR("ACDKIR", DS)
2870 ENDPROC
2880 :
2890 DEF PROCos
2900 REPEAT CLS: PRINTCHR$129; "Enter O.S
. command <RETURN> to continue": INPUT *
os$
2910 OSCLI("!*"+os$): IF os$<0 KX=GET
2920 UNTIL os$="": CLS
2930 ENDPROC
2940 :
2950 DEF PROCsave
2960 CLS: PRINT CHR$129; "Saving to disc.
. "
2970 PROCslenu
2980 REPEAT CLS: PRINT CHR$131; "Enter fi
lename to save.. "
2990 INPUT "name$:" NX=OPENIN(DS+ ". "+name
$)
3000 IF NX=0 PRINTCHR$129; "File alread
y exists! OK? <Y/N>": KX=GET$
3010 UNTIL NX=0 OR KX="Y" OR KX="y": CLO
SE#0: NX=OPENOUT(DS+ ". "+name$)
3020 IF DS="A" PRINTNX, tempoX, durX, syn
cX, flushX, randX, intX, tranX, ctranX, btranX
, ktranX, maxX, strictX, softX, DX, FX, GX, HX, I
%, JX, KX, RX
3030 IF DS="C" OR DS="A" PRINTNX, CX: FO
R cX=0 TO CX: PRINTNX, cX(cX): NEXT
3040 IF DS="D" OR DS="A" PRINTNX, PX: FO
R cX=0 TO PX: PRINTNX, dX(cX): NEXT: FOR ke
yX=0 TO 9: PRINTNX, pat$(keyX), seq$(keyX)
: NEXT
3050 IF DS="K" OR DS="A" PRINTNX, QX: FO
R bX=0 TO QX: PRINTNX, kb?bX: NEXT
3060 IF DS="I" OR DS="A" FOR keyX=0 TO
9: PRINTNX, ins$(keyX): FOR parX=0 TO 12: P
RINTNX, ex$(keyX, parX): NEXT: NEXT
3070 IF DS="R" OR DS="A" FOR keyX=0 TO
9: PRINTNX, rhyth$(keyX), rseq$(keyX), rac
c$(keyX): NEXT
3080 CLOSE#0: VDU15: FFX125
3090 ENDPROC
3100 :
3110 DEF PROCload
3120 CLS: PRINT CHR$129; "Loading from di
sc.. "
3130 PROCslenu
3140 REPEAT CLS: PRINT CHR$131; "Enter fi
lename to load.. "
3150 INPUT "name$:" NX=OPENIN(DS+ ". "+name
$)
3160 IF NX=0 PRINT CHR$129; "No file on
disc! <RETURN> to continue": KX=GET
3170 UNTIL NX=0
3180 IF DS="A" INPUTNX, tempoX, durX, syn
cX, flushX, randX, intX, tranX, ctranX, btranX
, ktranX, maxX, strictX, softX, DX, FX, GX, HX, I
%, JX, KX, RX
3190 IF DS="C" OR DS="A" INPUTNX, CX: FO
R cX=0 TO CX: INPUTNX, cX(cX): NEXT
3200 IF DS="D" OR DS="A" INPUTNX, PX: FO
R cX=0 TO PX: INPUTNX, dX(cX): NEXT: FOR ke
yX=0 TO 9: INPUTNX, pat$(keyX), seq$(keyX)
: NEXT
3210 IF DS="K" OR DS="A" INPUTNX, QX: FO
R bX=0 TO QX: INPUTNX, kb?bX: NEXT
3220 IF DS="I" OR DS="A" FOR keyX=0 TO
9: INPUTNX, ins$(keyX): FOR parX=0 TO 12: I
NPUTNX, ex$(keyX, parX): NEXT: NEXT
3230 IF DS="R" OR DS="A" FOR keyX=0 TO
9: INPUTNX, rhyth$(keyX), rseq$(keyX), rac
c$(keyX): NEXT
3240 CLOSE#0: VDU15: FFX125
3250 ENDPROC
3260 :
3270 DEF PROCperc(dX)
3280 X=POS: YX=VPOS: VDU20, 0, 24, 39, 2
3290 PRINTTAB(lpX*4, 21); CHR$131; TAB(dxX*4
, 21); CHR$129;
3300 IF dX<9 PRINTTAB(dxX*4+4, 21); CHR$13
1;
3310 lpX=dX: percX=seq$(dX): VDU20, 0, 19, 3
9, 17, 31, XX, YX
3320 ENDPROC
3330 :
3340 DEF PROCchrd
3350 X=POS: YX=VPOS: VDU20, 0, 24, 39, 2
3360 PRINTTAB(lcX*4, 20); CHR$135; TAB(JX*4
, 20); CHR$129;
3370 IF JX<9 PRINTTAB(JX*4+4, 20); CHR$13
5;
3380 lcX=JX: VDU20, 0, 19, 39, 17, 31, XX, YX
3390 ENDPROC
3400 :
3410 DEF PROCrhythm
3420 X=POS: YX=VPOS: VDU20, 0, 24, 39, 2
3430 PRINTTAB(lrX*4, 19); CHR$130; TAB(RX*4
, 19); CHR$129;
3440 IF RX<9 PRINTTAB(RX*4+4, 19); CHR$13
0;
3450 IF RX maxX=LENrseq$(RX): IF maxX=0
maxX=1
3460 lrX=RX: VDU20, 0, 19, 39, 17, 31, XX, YX
3470 ENDPROC
3480 :
3490 DEF PROCinstrum(iX)
3500 X=POS: YX=VPOS: VDU20, 0, 24, 39, 2
3510 PRINTTAB(liX*4, 18); CHR$134; TAB(iX*4
, 18); CHR$129;
3520 IF iX<9 PRINTTAB(iX*4+4, 18); CHR$13
4;
3530 liX=iX: PROCenv: VDU20, 0, 19, 39, 17, 31
, XX, YX
3540 ENDPROC
3550 :
3560 DEF PROCenv
3570 IF GX iX=FX ELSE iX=iX
3580 ENVELOPE 1+0*GX, ex(iX, 0), ex(iX, 1)
, ex(iX, 2), ex(iX, 3), ex(iX, 4), ex(iX, 5), ex(
iX, 6), ex(iX, 7), ex(iX, 8), ex(iX, 9), ex(iX, 1
0), ex(iX, 11), ex(iX, 12)
3590 IF GX ENDPROC
3600 ENVELOPE 2, ex(iX, 0), ex(iX, 1), ex(iX
, 2), ex(iX, 3), ex(iX, 4), ex(iX, 5), ex(iX, 6)
, ex(iX, 7), ex(iX, 8), ex(iX, 9), ex(iX, 10), ex
(iX, 11)-softX, ex(iX, 12)-softX
3610 ENDPROC

```

Continued ▶


```

3620 :-
3630 DEF PROCdefaultinstruments
3640 RESTORE 3700
3650 FOR key%:=0 TO 9
3660 READ ins$(key%)
3670 FOR par%:=0 TO 12
3680 READ ex(key%,par%)
3690 NEXT:NEXT
3700 DATA sq,1,0,0,0,0,0,0,0,0,0,0,0,-80,
80,80
3710 DATA syn,6,-1,-1,-1,1,1,1,1,1,20,-5,0,-
10,120,80
3720 DATA pno,5,0,0,0,0,0,0,0,120,-5,-2,-
20,120,80
3730 DATA eco,12,0,8,12,1,1,1,1,1,20,-8,-1
-10,120,80
3740 DATA pan,1,0,1,-2,1,1,1,20,-3,0,-5
120,80
3750 DATA vib,8,-1,-1,-1,1,1,1,1,20,-8,-4
-4,120,80
3760 DATA org,1,0,0,0,0,0,0,0,10,5,0,-20,
80,100
3770 DATA ham,4,-1,-1,-1,1,1,1,20,10,0,-
30,80,100
3780 DATA vnd,1,0,0,0,0,0,0,0,50,0,0,-15,
100,100
3790 DATA str,8,-1,-1,-1,1,1,1,10,5,0,-5
80,100
3800 ENDPROC
3810 :-
3820 DEF PROCheader
3830 CLS:PRINT CHR$129;"Enter or edit c
hords on function keys:"
3840 PROCinputmenu
3850 PRINT CHR$134; "<key>";CHR$131;"se
lect function key"
3860 PRINT CHR$134; "<TAB> ";CHR$131;"def
ault chords"
3870 PROCkeys
3880 ENDPROC
3890 :-
3900 DEF PROCdefchords
3910 PROCheader:VDU23,1,1;0;0;0;
3920 REPEAT VDU31,JX=+1,20:PROcinpu
T(JX) IF ins%"K" OR ins%"K">c(JX)=ins$
TR$ (JX):PROCdefnotes(JX):PROCheader
3930 IF k%<9 PROCdefaultchords:PROCkey s
3950 IF k%<210 AND k%<220 JX=k%-210:PRO C
hord:VDU28,0,24,39,2
3960 IF k%<3 c(JX)=ins$
3970 UNTIL FALSE
3980 ENDPROC
3990 :-
4000 DEF PROCdefnotes(k%)
4010 CLS:PRINT CHR$129;"Enter pitch of
notes for harmony k%";k%;"... "
4020 FOR ix:=1 TO 12:PRINTTAB(0,ix+2)CHR
$133;Hios("B A G F E D C",ix,1);CHR$135;
NEXT
4030 FOR ix:=1 TO 12:FOR jx:=1 TO 5:PRIN T
AB(jx%5,15-ix):ix%4+1+(jx-1)*48:NEXT,
4040 PRINTTAB(0,16)CHR$134;"Pitch of no
te %":ix=-1
4050 REPEAT ix=ix+1
4060 PRINTTAB(15,ix);ix;-";CHR$135;"
"
4070 INPUTTAB(19,16)"p%(k%,ix)
4080 UNTIL ix=7
4090 ENDPROC
4100 :-
4110 DEF PROCdefaultchords
4120 RESTORE 4140
4130 FOR key%:=0 TO 9:READ cs(key%):NEX T
4140 DATASEq,c,dm,em,f,gf,am,b,-cm,f,'
4150 ENDPROC
4160 :-
4170 DEF PROCkeys
4180 PRINTTAB(0,18)CHR$134;:FOR key%:=0
TO 9:PRINTTAB(key%*4+1,18)ins$(key%):NE XT
4190 PRINTTAB(0,19)CHR$130;:FOR key%:=0
TO 9:PRINTTAB(key%*4+1,19)rhyth$(key%);
:NEXT
4200 FOR key%:=0 TO 9:PRINTTAB(key%*4+1,
20)c$(key%):NEXT
4210 PRINTTAB(0,21)CHR$131;:FOR key%:=0
TO 9:PRINTTAB(key%*4+1,21)pats$(key%):NE XT
4220 PRINTTAB(0,22)CHR$129;:"f0 f1 f2
f3 f4 f5 f6 f7 f8 f9";
4230 PRINTTAB(lx%4,18)CHR$129;
4240 IF lx%>9 PRINTTAB(lx%*4+4,18)CHRS
134;
4250 PRINTTAB(lr%*4,19)CHR$129;
4260 IF lr%>9 PRINTTAB(lr%*4+4,19)CHRS
130;
4270 PRINTTAB(lp%*4,21)CHR$129;
4280 IF lp%>9 PRINTTAB(lp%*4+4,21)CHRS
131;
4290 PRINTTAB(lc%*4,20)CHR$129;
4300 IF lc%>9 PRINTTAB(lc%*4+4,20)CHRS
135;
4310 ENDPROC
4320 :-
4330 DEF PROCinputmenu
4340 *FX280,48
4350 PRINTCHR$134;"abcde f g(k)":CHR$131;
"Root Note":CHR$134;"ABCDEF G(K)":CHR$131;
"Accent":

```

```

4360 PRINTCHR$134;"#";CHR$131;"Sharp,";
4370 "P";CHR$131;"Flat";
4370 PRINTCHR$134;"m";CHR$131;"Minor,";
4380 CHR$134;"M";CHR$131;"Major";
4380 PRINTCHR$134;"#";CHR$131;"Augmente
d";CHR$134;"-";CHR$131;"Diminished"
4390 PRINTCHR$134;"s";CHR$131;"Suspende
d Fourth"
4400 PRINTCHR$134;"6";CHR$131;"Sixth,";
4410 CHR$134;"7";CHR$131;"Seventh,";CHR$134;"
9";CHR$131;"Ninth"
4410 PRINTCHR$134;"11";CHR$131;"Elevent
h";CHR$134;"13";CHR$131;"Thirteenth"
4420 PRINTCHR$134;"//";CHR$131;"Repeat c
hord,";CHR$134;"//";CHR$131;"Rest"
4430 ENDPROC
4440 :
4450 DEF PROCinput
4460 in$=""
4470 REPEAT k$=GET:k$=CHR$k$
4480 IF INSTR(Input$,k$) in$=in$+k$:PRI
NTk$;
4490 IF k$=127 in$=LEFT$(in$,LEN(in$)-2
)
4500 UNTIL k$=9 OR k$=13 OR k$=78 OR k$
>127
4510 ENDPROC
4520 :
4530 DEF PROCedit(p$)
4540 LOCAL mn$,mx$:in$=""
4550 IF p$ mn$=1:mx$=p$ ELSE mn$=10:mx$
=C$
4560 *FX4,1
4570 CLS:IF p$ PRINT CHR$129;"Enter or
edit drum/bass sequence:";CHR$134;"<fke
y>";CHR$131;"to enter pattern":GOTO 4590
4580 PRINT CHR$129;"Enter or edit chord
sequence:";PROCinputmenu
4590 PRINTCHR$134;"("";CHR$131;"Start se
quence,";CHR$134;"")";CHR$131;"Repeat se
quence,";CHR$134;"<CSR>";CHR$131;"Select";
CHR$134;"<TAB>";CHR$131;"Delete";CHR$134;"
<COPY>";CHR$131;"Insert";CHR$134;"<Q>
";CHR$131;"New or clear sequence"
4600 IF p$ PROCkeys=VDU28,0,18,39,11:P
ROCPrintpts ELSE VDU28,0,24,39,17:PROCP
rintchords
4610 VDU23,1,1,0;0;0;0;
4620 c$=mn$:l$=mx$:PROChighlight
4630 REPEAT
4640 IF p$ k$=GET ELSE PROCinput
4650 IF k$=78 AND p$=1:c$=1:l$=1:c$=C$
4660 IF k$=138 c$=c$+8:IF c$>mx$ c$=mx$
4670 IF k$=139 c$=c$-8:IF c$<mn$ c$=mn$
4680 IF k$=40 OR k$=41 AND p$(c$)=k$=
=30:PRINTp$(k$-30):IF c$=P$ P$=P$+1:c$
=P$
4710 IF k$>199 AND k$<210 d$(c$)=k$-200
:PRINTp$(k$-200);IF c$=P$ P$=P$+1:c$=
P$
4720 IF k$=13 AND p$=0 c$(c$)=in$:PRINT
SPC$(5-LENin$):IF c$=C$ P$=1:c$=C$
4730 IF k$=9 AND p$ AND C$>c$ PROCdelet
epat ELSE IF k$=9 AND p$=0 AND C$>c$ PRO
Cdelethead
4740 IF k$=135 AND p$ PROCinsertpat ELS
E IF k$=135 PROCinsertchord
4750 IF p$ mx$=P$ ELSE mx$=C$
4760 PROChighlight
4770 UNTIL C$=60 OR P$=50
4780 ENDPROC
4790 :
4800 DEF PROCdelethead
4810 FOR i$=C$ TO C$-1(c$)=c$(i$+1):
NEXT
4820 C$=C$-1:IF C$=10 c$(10)=""
4830 PROCprintchords
4840 ENDPROC
4850 :
4860 DEF PROCdeletpat
4870 FOR i$=C$ TO P$-1:d$(i$)=d$(i$+1):
NEXT
4880 P$=P$-1:IF P$=1 d$(1)=0
4890 PROCprintpts
4900 ENDPROC
4910 :
4920 DEF PROCinsertchord
4930 FOR i$=C$ TO C$+1 STEP -1:c$(i$)=
$(i$-1):NEXT
4940 C$=C$+1:c$(C$)=""PROCprintchords
4950 ENDPROC
4960 :
4970 DEF PROCinsertpat
4980 FOR i$=P$ TO C$+1 STEP -1:d$(i$)=
$(i$-1):NEXT
4990 P$=P$+1:PROCprintpts
5000 ENDPROC
5010 :
5020 DEF PROCprintchords
5030 CLS:FOR i$=10 TO C$-1:PRINTTAB((C$
-i$)/MOD8)+$1,(i$-1)/DIV8)c$(i$);NEXT
5040 ENDPROC
5050 :
5060 DEF PROCprintpts
5070 CLS:FOR i$=1 TO P$-1:PRINTTAB((P$
-i$)/MOD8)+$1,(i$-1)/DIV8)p$(i$);NEXT

```

```

1)MOD8)*5+1,(cX-1)DIV8)pat$(dX(cX));:NE
T
5080 ENDPROC
5090 :
5100 DEF PROChighmht
5110 PRINTTAB(((lCdX-nx)(MOD8)*5,(lCdX-mnX)DIV8)CHR$135;
5120 PRINTTAB(((cX-nx)(MOD8)*5,(cX-mnX)DIV8)CHR$129;
5130 IF ((cX-mnX)(MOD8)+5<39 PRINTTAB((cX-mnX)MOD8)*5+5,(cX-mnX)DIV8)CHR$135;
5140 lCdX=cX
5150 VDU31,((cX-mnX)MOD8)*5+1,(cX-mnX)D
IV8
5160 ENDPROC
5170 :
5180 DEF PROCdrum(d$)
5190 LOCAL envX,pitch
5200 IF envX="" OR d$=" " OR d$=" " ENDP
OC
5210 IF INSTR("HMLDRCTPWBW",d$) envX=3:
d$=CHR$(ASC(d$)+32) ELSE envX=4
5220 pitch=INSTR(" .phmlw",d$)+INSTR("
.lbc.r",d$)
5230 IF d$="t" SOUND&10+chX,envX+6,245,
1:cX=chXMOD(3-GX)+1:ENDPROC
5240 IF d$="c" envX=envX+6:SOUND&10+chX
,envX,255,1:cX=chXMOD(3-GX)+1
5250 IF d$="S" SOUND&11,0,128,-1:cX=2
5260 IF d$="r" SOUND&10,envX+2,pitch,d
urX:ENDPROC
5270 IF d$=" " SOUND&11,7,255,1:IF chX=
1 chX=2
5280 IF d$="w" SOUND&11,8,150,1:envX=en
vX+6:IF chX=1 chX=2
5290 IF d$="b" SOUND&11,0,pX(LF,noiseX)
+tranX+btanX,-1:envX=envX+6:IF chX=1 chX
=2
5300 IF d$="n" SOUND&10+chX,envX-2,pX(U
%),noteX)+tranX+ctranX,durX:chX=chXMOD(3-
GX)+1:ENDPROC
5310 SOUND&10,envX,pitch,X1
5320 ENDPROC
5330 :
5340 DEF PROCdefaultrhythms
5350 RESTORE 5370
5360 FOR keyX=0 TO 9:READ pat$(keyX),se
q$(keyX):NEXT
5370 DATA seq,"","snr,H'hh'Lldrm
,D'""ddd,cym,C'""""tri,t'ttt",p/W,
P'""""brr,R'""""f,bss,B'""bb'b,nte,N
'n'nnn",rst,"
5380 pat$(10)="(:pat$(11))":
5390 ENDPROC
5400 :
5410 DEF PROCDefeaultRhythms
5420 RESTORE 5440
5430 FOR keyX=0 TO 9:READ rhythms(keyX)
,rseq$(keyX),racc$(keyX):NEXT
5440 DATA off,, ,arp,12345670,12222222
,2/4,20401676,12221222,3/4,100320041567,
122212221222,4/4,2056103020001004,122212
12221222,5/4,104520671040354561765,1222
1222122212221222,6/8,103020574060,12222
122222
5450 DATA 7/8,10003420601567,1222222222
2222,8/8,1020504318706250,122222222222
222,9/8,206010302040106725,122222122221
2222
5460 ENDPROC
5470 :
5480 DEF PROCYmenu
5490 X=YPOS:Y=YPOS:VDU28,0,16,39,2
5500 CLS:PRINTCHR$135;ins$(IX);CHR$129"<> parameter <CJ> value"
5510 PRINTCHR$131;"time unit ";:C
HR$134;:eX(I,0)
5520 PRINTCHR$131;"pitch increase 1 ";:C
HR$134;:eX(I,1)
5530 PRINTCHR$131;"pitch increase 2 ";:C
HR$134;:eX(I,2)
5540 PRINTCHR$131;"pitch increase 3 ";:C
HR$134;:eX(I,3)
5550 PRINTCHR$131;"pitch number 1 ";:C
HR$134;:eX(I,4)
5560 PRINTCHR$131;"pitch number 2 ";:C
HR$134;:eX(I,5)
5570 PRINTCHR$131;"pitch number 3 ";:C
HR$134;:eX(I,6)
5580 PRINTCHR$131;"attack level";:C
HR$134;:eX(I,7)
5590 PRINTCHR$131;"decay level";:C
HR$134;:eX(I,8)
5600 PRINTCHR$131;"sustain level";:C
HR$134;:eX(I,9)
5610 PRINTCHR$131;"release level";:C
HR$134;:eX(I,10)
5620 PRINTCHR$131;"attack level 2";:C
HR$134;:eX(I,11)
5630 PRINTCHR$131;"decay level 2";:C
HR$134;:eX(I,12);
5640 PRINTTAB(25,lastparX+1)CHR$129;CHR
$157;CHR$135;:eX(I,lastparX);
5650 VDU28,0,19,39,17,31,XX,YX
5660 ENDPROC
5670 :
5680 DEF PROCvaryenV(kX)
5690 LOCAL xX,yX,parX:parX=lastparX
5700 X=XPOS:Y=YPOS:VDU28,0,24,39,2
5710 IF kX>229 xX=X-Y:Y=Y:PROCVmenu:

```

```

DUZD=0,24,39,2:XX=XZ:YY=YX:PRINTTAB(1,0
)ins$(IX):VDU23,1,1;0;0;0::INPUTTAB(IX&
4,1,18)""ins:VDU23,1,1;0;0;0::IF ins<0
)ins$(IX)=LEFT$(ins,3):PRINTTAB(1,0)ins$(
IX):GOTO 5800 ELSE IF KK>229 GOTO 5800
5720 IF KK=136 ex(IX,parX)=ex(IX,parX)-
1+9*INKEY(-1)
5730 IF KK=137 ex(IX,parX)=ex(IX,parX)+
1-9*INKEY(-1)
5740 IF KK=138 parX=parX+1:IF parX>12 p
arX=0
5750 IF KK=139 parX=parX-1:IF parX<0 pa
rX=12
5760 PRINTTAB(25,lastparX+1)"";CHR$13
5;
5770 PRINTTAB(25,parX+1)CHR$129;CHR$157
;CHR$135;ex(IX,parX);"
5780 lastparX=parX
5790 PROCvN
5800 VDU28,0,19,39,17,31,XX,YY
5810 ENDPROC
5820 :
5830 DEF PROCrhythmenu
5840 XS=POS:YX=VPOS:VDU28,0,16,39,2
5850 CLS:PRINT"CHR$129:"Varying";CHR$13
5;rhythm$(RX);TAB(12,1)CHR$129;"Rhyth
a num";CHR$135;pat$(IX);TAB(27,1)CHR$129;"D
rum"
5860 PRINTCHR$134;:<C1>"";CHR$131;"tem
po";TAB(30,3)CHR$129;tempo&maxX
5870 PRINTCHR$134;:<C0>"";CHR$131;"bea
ts per bar";TAB(30,3)CHR$129;maxX
5880 PRINTCHR$134;:<C>"";CHR$131;"edi
t";CHR$134;:<DEL>"";CHR$131;"Rhythm";CHR$
134;:<+SHD>"";CHR$131;"Drum"
5890 PRINTCHR$134;:<01234567>"";CHR$13
1;"pitch number"
5900 PRINTCHR$134;:<0>"";CHR$131;"acc
ent on";CHR$134;:</>"";CHR$131;"acc
ent off"
5910 PRINTCHR$134;:<C1HMLDRCTPWN>;CHR$
131;"drum hit accent on"
5920 PRINTCHR$134;:<C1hmldrctpwn>;CHR$
131;"drum hit accent off"
5930 ntX=1:PRINTCHR$129;"v"
5940 PRINTTAB(0,11)CHR$130;rseq$(RX)
5950 PROCrtacc
5960 PRINTTAB(0,13)CHR$131;seq$(IX)
5970 VDU28,0,19,39,17,31,XX,YY
5980 ENDPROC
5990 :
6000 DEF PROCrtacc
6010 PRINTTAB(0,12)"";
6020 FOR iX=1 TO LENracc$(RX)
6030 IF MID$(racc$(RX),iX,1)="" PRINT
TAB(0,12);ELSE PRINT"/";
6040 NEXT
6050 ENDPROC
6060 :
6070 DEF PROCvN
6080 X=POS:YX=VPOS:VDU28,0,24,39,2
6090 v$=CHR$(VX)
6100 IF VX>219 AND VX<230 PRINTTAB(1,1)
1)SPC(39)TAB(1,11)rseq$(RX)TAB(1,12)SPC(
1)C(9)TAB(9,1)rhythm$(RX):PROCrtaacc:VDU23,
1,0;0;0;0::INPUTTAB(RX&4+1,19)""ins:VDU23,
1,0;0;0;0;0::IF ins<0""rhythm$(RX)=LEFT
$(ins,3):PRINTTAB(9,1)rhythm$(RX)
6110 IF VX>200 AND VX<210 PRINTTAB(1,1)
1)SPC(39)TAB(1,13)seq$(IX)TAB(24,1)pat$(
12):VDU23,1,1;0;0;0;0::INPUTTAB(RX&4+1,21)
""ins:VDU23,1,0;0;0;0;0::IF ins<0""pat$(K
X)=LEFT$(ins,3):PRINTTAB(24,1)pat$(KX)
6120 IF KK=136 OR KK=137 PROCTempo(KX)
6130 IF VX=60 AND maxX<1 maxX=maxX+1:P
INTTAB(ntX,10)""ntX=maxX:PRINTTAB(ntX,
10)""v"
6140 IF VX=62 AND maxX<32 maxX=maxX+1:
PRINTTAB(ntX,10)""ntX=maxX:PRINTTAB(nt
X,10)""v"
6150 IF INSTR("01234567",v$) AND ntX<L
Nrseq$(RX)+1 rseq$(RX)=LEFT$(rseq$(RX),
ntX-1)+v$+RIGHT$(rseq$(RX),LENrseq$(RX)-
ntX):PRINTTAB(ntX,11)v"
6160 IF v$="" AND ntX<LENracc$(RX)+1
acc$(RX)=LEFT$(racc$(RX),ntX-1)+v$+RIG
T$(racc$(RX),LENracc$(RX)-ntX):PRINTTAB
ntX,12)v"
6170 IF v$="/" AND ntX<LENracc$(RX)+1
acc$(RX)=LEFT$(racc$(RX),ntX-1)+v$+RIG
T$(racc$(RX),LENracc$(RX)-ntX):PRINTTAB
ntX,12)v"
6180 IF INSTR("01234567",v$) AND ntX<L
Nrseq$(RX)+1 rseq$(RX)=rseq$(RX)+v$:rac
$(RX)=racc$(RX)+v$:PRINTTAB(ntX,11)v"
6190 IF VX=127 AND INKEY(-1)=0 PRINTA
B(LENrseq$(RX),11)""TAB(LENrseq$(RX),12)
""rseq$(RX)=LEFT$(rseq$(RX),LENrseq$(
X)-1)+maxX=maxX-1
6200 PRINTTAB(31,3):tempo&maxX;"TAB
31,4);maxX;""
6210 IF INSTR("hmldrctpwnhmlDRCTPWN
v$) AND ntX<LENseq$(KX)+1 seq$(KX)=LEF
T$(seq$(KX),ntX-1)+v$+RIGHT$(seq$(KX),LE
Nseq$(KX)-ntX):PRINTTAB(ntX,13)v"
6220 IF INSTR("hmldrctpwnhmlDRCTPWN
v$) AND ntX<LENseq$(KX)+1 seq$(KX)=seq
$(KX)+v$:PRINTTAB(ntX,13)v$=v$&46

```


STRUM

Continued

```
6230 IF V%127 AND INKEY(-1) PRINTTAB(L
ENSEQ$(K%)-13) " :SEQ$(K%)=LEFT$(SEQ$(K%
),LENSEQ$(K%)-1)
```

```
6240 IF V%46 AND NT%32 PRINTTAB(NT%,1
0) " :NT%=NT%+1:PRINTTAB(NT%,10) "V"
6250 IF V%44 AND NT%>1 PRINTTAB(NT%,10
```

```
) " :NT%=NT%-1:PRINTTAB(NT%,10) "V"
6260 VDU28,0,19,39,17,31,X%,Y%
6270 ENDPROC
6280 :
```

LIFE

Listing 1

```
10 REM LifeAss
20 REM by Phil Bender
30 REM for B/B+/M/C
40 REM (C) BAU May 1990
50 :
60 MODE 7
70 CLO=&70:CHI=&71
80 VLO=&72:VHI=&73
90 TEMPA=&74:TEMPX=&75:TEMPY=&76
100 LOY=&77:HIY=&78
110 SCRLO=&79:SCRHI=&7A
120 GEN=&7B:DELAY=&7F:CHAR=&80
130 COL=&80:ROW=&80
140 CELLS=&2000:VOTES=&2800
150 OSBYTE=&FFF4:OSWRCH=&FFEE
160 FOR OPT=0 TO 3 STEP 3
170 PX=&900
180 [OPT OPT
190 .zero
200 STA VHI
210 LDX#8
220 LDA#0
230 STA VLO
240 TAY
250 .loop
260 STA (VLO),Y
270 INY
280 BNE loop
290 INC VHI
300 DEX
310 BNE loop
320 RTS
330 :
340 .life
350 SEI
360 LDA#CELLS DIV 256
370 STA CHI
380 LDA#0
390 STA CLO
400 LDX#31
410 .loop2
420 LDY#63
430 .loop3
440 LDA(CLO),Y
450 BEQ next
460 JMP vote
470 .next
480 DEY
490 BPL loop3
500 LDA CLO
510 CLC
520 ADC#64
530 STA CLO
540 BCC done1
550 INC CHI
560 .done1
570 DEX
580 BPL loop2
590 :
600 .update
610 LDA#VOTES DIV 256
620 STA VHI
630 LDA#CELLS DIV 256
640 STA CHI
650 LDA#0
660 STA VLO
670 STA CLO
680 LDX#0
690 .loop4
700 LDY#63
710 .loop5
720 LDA(VLO),Y
730 BEQ nowt
740 CMP#4
750 BNE chk3
760 LDA#0
770 STA(VLO),Y
780 BEQ nowt
790 .chk3
800 CMP#3
810 BNE dead
820 LDA#0
830 STA(VLO),Y
840 LDA(CLO),Y
850 BNE nowt
860 LDA#1
870 JMP print
880 .dead
890 LDA#0
900 STA(VLO),Y
910 LDA(CLO),Y
920 BEQ nowt
930 LDA#0
940 JMP print
950 .nowt
960 DEY
970 BPL loop5
980 INX
```

```
990 LDA VLO
1000 CLC
1010 ADC#64
1020 STA VLO
1030 STA CLO
1040 BCC loop4
1050 INC VHI
1060 INC CHI
1070 CPX#32
1080 BNE loop4
1090 .laldone
1100 LDX#8
1110 .loop6
1120 INC gen,X
1130 LDA gen,X
1140 CMP#58
1150 BNE nocarry
1160 LDA#48
1170 STA gen,X
1180 INX
1190 CPX#4
1200 BNE loop6
1210 .nocarry
1220 LDA#31
1230 JSR oswrch
1240 LDA#73
1250 JSR oswrch
1260 LDA#25
1270 JSR oswrch
1280 LDX#3
1290 .loop7
1300 LDA gen,X
1310 JSR oswrch
1320 DEX
1330 BPL loop7
1340 LDA delay
1350 BEQ key1
1360 .loopA
1370 TAX
1380 .loopB
1390 LDY#0
1400 .loopC
1410 INY
1420 BNE loopC
1430 DEX
1440 BNE loopB
1450 DEC delay
1460 BNE loopA
1470 STA delay
1480 .key1
1490 LDA#881
1500 LDX#CF
1510 LDY#FF
1520 JSR osbyte
1530 BCC key2
1540 LDA#24
1550 STA delay
1560 JMP life
1570 .key2
1580 LDA#881
1590 LDX#CE
1600 LDY#FF
1610 JSR osbyte
1620 BCC key3
1630 LDA#10
1640 STA delay
1650 JMP life
1660 .key3
1670 LDA#881
1680 LDX#EE
1690 LDY#FF
1700 JSR osbyte
1710 BCC p
1720 LDA#0
1730 STA delay
1740 JMP life
1750 .p
1760 LDA#881
1770 LDX#CB
1780 LDY#FF
1790 JSR osbyte
1800 BCC q
1810 .o
1820 LDA#881
1830 LDX#C9
1840 LDY#FF
1850 JSR osbyte
1860 BCC o
1870 .q
1880 LDA#881
1890 LDX#EF
1900 LDY#FF
1910 JSR osbyte
1920 BCS ret
1930 JMP life
1940 .ret
1950 CLI
1960 RTS
```

```
1970 :
1980 .vote
1990 STY tempy \123
2000 LDA CLO \4*6
2010 STA VLO \789
2020 LDA CHI
2030 CLC
2040 ADC#8
2050 STA VHI
2060 LDA(VLO),Y
2070 ADC#1
2080 STA(VLO),Y \5
2090 DEY
2100 TYA
2110 AND#63
2120 TAY
2130 STY LOY
2140 LDA(VLO),Y
2150 ADC#1
2160 STA(VLO),Y \4
2170 INY
2180 INY
2190 TYA
2200 AND#63
2210 TAY
2220 STY HIY
2230 LDA(VLO),Y
2240 ADC#1
2250 STA(VLO),Y \6
2260 LDA VLO
2270 SEC
2280 SBC#64
2290 STA VLO
2300 BCS here1
2310 DEC VHI
2320 LDA VHI
2330 CMP#827
2340 BNE here1
2350 LDA #82F
2360 STA VHI
2370 .here1
2380 LDA(VLO),Y
2390 CLC
2400 ADC#1
2410 STA(VLO),Y \3
2420 LDY tempy
2430 LDA(VLO),Y
2440 ADC#1
2450 STA(VLO),Y \2
2460 LDY LOY
2470 LDA(VLO),Y
2480 ADC#1
2490 STA(VLO),Y \1
2500 LDA VLO
2510 CLC
2520 ADC#128
2530 STA VLO
2540 BCC here2
2550 INC VHI
2560 LDA VHI
2570 CMP#830
2580 BNE here2
2590 LDA#828
2600 STA VHI
2610 .here2
2620 LDA(VLO),Y
2630 CLC
2640 ADC#1
2650 STA(VLO),Y \7
2660 LDY HIY
2670 LDA(VLO),Y
2680 ADC#1
2690 STA(VLO),Y \9
2700 LDY tempy
2710 LDA(VLO),Y
2720 ADC#1
2730 STA(VLO),Y \8
2740 JMP next
2750 :
2760 .print
2770 STY tempy
2780 STX tempx
2790 STA tempa
2800 STA (CLO),Y
2810 TYA
2820 ASL A
2830 TAY
2840 TAX
2850 ASL A
2860 TAX
2870 LDA row,X
2880 CLC
2890 ADC COL,Y
2900 STA SCRLO
2910 LDA ROW+1,X
2920 ADC COL+1,Y
2930 STA SCRHI
2940 LDA tempa
```

```
2950 BEQ nul
2960 LDY#7
2970 .loop8
2980 LDA char,Y
2990 STA(SCRLO),Y
3000 DEY
3010 BNE loop8
3020 BEQ fin
3030 .nul
3040 LDY#7
3050 .loop9
3060 STA(SCRLO),Y
3070 DEY
3080 BNE loop9
3090 .fin
3100 LDX tempx
3110 LDY tempy
3120 JMP nowt
3130 .end
3140 J
3150 NEXT
3160 PROCcheck("zero","life",&C41)
3170 PROCcheck("life","update",&1083)
3180 PROCcheck("update","vote",&7F80)
3190 PROCcheck("vote","print",&306A)
3200 PROCcheck("print","end",&1B75)
3210 *SAVE LIFCODE 900 B00
3220 END
3230 DEFPROCcheck(start$,end$,sum%)
3240 TX=0
3250 FOR JX=EVAL start$ TO EVAL end$
3260 TX=TX+JX
3270 NEXT
3280 IF TX>sum% PRINT"Error - check co
de ":"start$," to ":"end$,"":END
3290 ENDPROC
```

Listing 2

```
10 REM Life
20 REM by Phil Bender
30 REM for B/B+/M/C/E
40 REM (C) BAU May 1990
50 :
60 IF !&900<&8A27385 THEN *LO. LIFCO
DE 900
70 IF PAGE>&1100 PROCrelac
80 *TV0,1
90 *FX4,1
100 MODE 0
110 VDU 23,8202,0,0,0,0;
120 HIMEM=&2000
130 JX=RND(-TIME)
140 gen%=&7B:delay%=&7F
150 zero%=&900:life%=&914
160 cells%=&2000:votes%=&2800
170 PROCTable
180 ?delay%=&10
190 FX=3:BX=4
200 VDU 19,0,BX,0;19,1,FX,0;
210 REPEAT
220 AX=cells% DIV 256:CALL zero%
230 !gen%=&30303030:REM ASC"0000"
240 PROCedit
250 AX=votes% DIV 256:CALL zero%
260 CALL life%
270 COLOUR 0:COLOUR 129
280 PRINTTAB(65,20);" Again? (Y/N) "
290 REPEAT KX=GET AND &DF
300 UNTIL KX=&78 OR KX=&89
310 UNTIL KX=&78
320 *FX4
330 END
340 DEF PROCTable
350 COL%=&C00:row%=&CB0
360 FOR JX=0 TO 63
370 ((COL%+2*JX)=JX*8
380 NEXT
390 FOR JX=0 TO 31
400 ((row%+2*JX)=83000+JX*&280
410 NEXT
420 FOR KX=0 TO 1
430 VDU 23,254+KX;
440 FOR JX=0 TO 7
450 READ DX:VDU DX
460 ?(&78+JX+KX*8)=DX
470 NEXT:NEXT
480 RESTORE
490 FOR KX=0 TO 1
500 VDU 23,252+KX;
510 FOR JX=0 TO 7
520 READ DX:VDU(DX EOR &FF)
530 NEXT:NEXT
540 DATA 0,0,0,0,0,0,0,0,0,24,60,110,7
8,110,60,24
550 ENDPROC
```

Continued ►

Continued ►

```

900 PRINTB(X%,Y%);CHR$(FNpeek+254);
910 X%=(X%+dx)*N AND 63
920 Y%=(Y%+dy)*N AND 31
930 PRINTAB(X%,Y%);CHR$(FNpeek+252);
940 ENDPROC
950 DEF FNpeek=(cells%+X%+64*Y%)
960 DEF PROCpoke(C%)
970 ?(cells%+X%+64*Y%)=C%
980 PROCmove(0,0)
990 ENDPROC
1000 DEF PROCreloc
1010 IF PAGE<=19000 THEN *T.
1020 K=.QF.X%-(TOT(TOP-PAGE)$4.X%+1100
1030 X%:PA..N:=XA=-1100[MO..MRUN]
1035 *F1X38,0,128
1040 END

```

```

2520 JSR &FFEE
2530 INC &82
2540 BNE DEL
2550 INC &83
2560 .DEL:LDA #0
2570 TAY
2580 STA (&82),Y
2590 LDA &80
2600 CMP &83
2610 BEQ KBI
2620 JMP GT
2630 .FA:CMP #13
2640 BEQ (CPCT)
2650 CMP #ASCT("0")
2660 BCC GT
2670 CMP #ASC(":")
2680 BCS GT
2690 PHA
2700 JSR &FFEE
2710 PLA
2720 AND #&F
2730 LDY #0
2740 STA (&82),Y
2750 DEC &82
2760 LDA &82
2770 CMP #&FF
2780 BNE GT
2790 DEC &83
2800 LDY &71
2810 DEY
2820 CPY &83
2830 BNE GT
2840 JMP FAULT
2850 .CPCT
2860 JSR &FFEE
2870 LDA #10
2880 JSR &FFEE
2890 INC &82
2900 BNE B2
2910 INC &83
2920 .B2
2930 LDY #0
2940 LDA LDA &71
2950 STY &80
2960 STA &81
2970 .R7:LDA (&82),Y
2980 CMP #&FF
2990 BEQ F8
3000 STA &80
3010 LDA #0
3020 STA (&82),Y
3030 INC &82
3040 BNE B3
3050 INC &83
3060 .B3
3070 LDA #&29
3080 CMP &83
3090 BEQ F9
3100 LDA (&82),Y
3110 CMP #&FF
3120 BEQ F9
3130 ASL A
3140 ASL A
3150 ASL A
3160 ASL A
3170 ORA &80
3180 STA (&80),Y
3190 LDA #0
3200 STA (&82),Y
3210 INC &82
3220 BNE B4
3230 INC &83
3240 .B4
3250 LDA &29
3260 CMP &83
3270 BEQ F8
3280 INC &80
3290 BNE B5
3300 INC &81
3310 .B5
3320 JMP R7
3330 .F9:LDA &80
3340 STA (&80),Y
3350 .F8:LDA #0:STA &28FF:JMP RESETA
3360 .FAULT:RRK:\) ***** ERROR *****

```


MATHS

Continued

```

3370 EQU 5
3380 EQU "MISTAKE IN MULTIPRECISION RO
UTINE"
3390 EQU 0
3400 .STR:JSR CLA\*** STRING
3410 JSR TSET
3420 LDA #8FE
3430 STA 882
3440 LDA #828
3450 STA 883
3460 LDA #8FF
3470 STA 828FF
3480 .SB1
3490 LDY #0
3500 LDA (880),Y
3510 CMP #80D
3520 BNE SB2
3530 JMP CPCT
3540 .SB2:CMP #ASC("0")
3550 BCC FAULT
3560 CMP #ASC(":")
3570 BCS FAULT
3580 AND #8F
3590 STA (882),Y
3600 DEC 882
3610 LDA 882
3620 CMP #8FF
3630 BNE STR1
3640 DEC 883
3650 .STR1:INC 880
3660 BNE STR2
3670 INC 881
3680 .STR2:CLC
3690 BCC SB1
3700 :
3710 \*****SET X & A TOP \*****
3720 .SATP:LDA 870
3730 CLC
3740 ADC #0
3750 STA 882
3760 LDA 871
3770 ADC #7
3780 STA 883
3790 RTS
3800 .SXTP:LDA 874
3810 CLC
3820 ADC #0
3830 STA 880
3840 LDA 875
3850 ADC #7
3860 STA 881
3870 RTS
3880 .SSTP:LDA 878
3890 CLC
3900 ADC #0
3910 STA 880
3920 LDA 879
3930 ADC #7
3940 STA 881
3950 RTS
3960 \***** COMPARE X & A \*****
3970 .CXA
3980 JSR SATP
3990 JSR SXTP
4000 JMP COMPARE
4010 \***** MULTIPLY X*A \*****
4020 .MXA
4030 JSR ASET
4040 JSR SETT
4050 JSR T2A
4060 LDA 872
4070 STA 87E
4080 LDA 873
4090 STA 87F
4100 JSR SATP
4110 JSR SXTP
4120 JSR CXA
4130 LDA 880
4140 BMI J3
4150 JSR ASET
4160 JSR SHFTLFT
4170 JSR A285
4180 JSR X287
4190 JSR T5
4200 LDA 876
4210 STA 889
4220 LDA 877
4230 STA 88A
4240 JSR CLA
4250 JSR TIMES
4260 JMP RESETA
4270 .J3:JSR XSET
4280 JSR SHFTLFT
4290 JSR A285
4300 JSR T287
4310 JSR X5
4320 LDA 872
4330 STA 889
4340 LDA 873
4350 STA 88A
4360 JSR CLA
4370 JSR TIMES
4380 JMP RESETA
4390 .T5:LDA 87C
4400 STA 88B
4410 LDA 870
4420 STA 88C
4430 RTS
4440 .A5:LDA 870
4450 STA 88B

```

```

4460 LDA 871
4470 STA 88C
4480 RTS
4490 .X5:LDA 874
4500 STA 88B
4510 LDA 875
4520 STA 88C
4530 RTS
4540 .A285:LDA 870
4550 STA 885
4560 LDA 871
4570 STA 886
4580 RTS
4590 .X287:LDX #3
4600 .RX2:LDA 874,X
4610 STA 887,X
4620 DEX
4630 BPL RX2
4640 RTS
4650 .T287:LDX #3
4660 .RT2:LDA 87C,X
4670 STA 887,X
4680 DEX
4690 BPL RT2
4700 RTS
4710 \***** 880 TO SHIFT \*****
4720 .SHFTLFT:LDX #8
4730 LDY #0
4740 STY 880
4750 LDA 878
4760 STA 882
4770 LDA 879
4780 STA 883
4790 .B1:LDA (880),Y
4800 PHA
4810 ASL A
4820 ASL A
4830 ASL A
4840 ASL A
4850 ORA 880
4860 STA (882),Y
4870 PLA
4880 LSR A
4890 LSR A
4900 LSR A
4910 LSR A
4920 STA 880
4930 INY
4940 BNE B1
4950 INC 881
4960 INC 883
4970 DEX
4980 BNE B1
4990 .SH3:LDA 878
5000 STA 88E
5010 LDA 879
5020 STA 88F
5030 RTS
5040 .TIMES:LDY #0
5050 LDA (887),Y
5060 PHA
5070 AND #8F
5080 BEQ FT1
5090 STA 88D
5100 .TB1
5110 LDA 885
5120 STA 882
5130 LDA 886
5140 STA 883
5150 LDA 88B
5160 STA 880
5170 LDA 88C
5180 STA 881
5190 LDX 877
5200 INX
5210 INX
5220 JSR ADD
5230 DEC 88D
5240 BNE TB1
5250 .FT1:PLA
5260 LSR A
5270 LSR A
5280 LSR A
5290 LSR A
5300 AND #8F
5310 BEQ TE
5320 STA 88D
5330 .TB2
5340 LDA 885
5350 STA 882
5360 LDA 886
5370 STA 883
5380 LDA 88E
5390 STA 880
5400 LDA 88F
5410 STA 881
5420 LDX 877
5430 INX
5440 JSR ADD
5450 DEC 88D
5460 BNE TB2
5470 .TE
5480 INC 885
5490 BNE BT2
5500 INC 886
5510 .BT2
5520 INC 887
5530 BNE BT3
5540 INC 888

```

```

5550 .BT3:DEC 889
5560 LDA #8FF
5570 CMP 889
5580 BNE TIMES
5590 DEC 88A
5600 BPL TIMES
5610 RTS
5620 \***** CLEAR REG \*****
5630 .CL2:LDY #0
5640 TYA
5650 LDX #8
5660 .CR1
5670 STA (880),Y
5680 INY
5690 BNE CR1
5700 :
5710 INC 881
5720 DEX
5730 BNE CR1
5740 RTS
5750 .CLSHFT
5760 JSR SSET
5770 JMP CL2
5780 .CLX
5790 JSR XSET
5800 JMP CL2
5810 .CLT
5820 JSR TSET
5830 JMP CL2
5840 \***** DIVIDE A BY X \*****
5850 .DXA
5860 JSR CLT
5870 JSR XSET
5880 JSR SHFTLFT
5890 SEC
5900 LDA 872
5910 SBC 876
5920 STA 87B
5930 LDA 873
5940 SBC 877
5950 BPL XD1
5960 JMP FAULT
5970 .XD1:STA 87F9
5980 CLC
5990 LDA 870
6000 ADC 87B
6010 STA 870
6020 LDA 871
6030 ADC 87F9
6040 STA 871
6050 CLC
6060 LDA 87B
6070 ADC 87C
6080 STA 88E
6090 LDA 87F9
6100 ADC 87D
6110 STA 88F
6120 LDA #0
6130 STA 884
6140 .DR1:JSR SSTP
6150 JSR SATP
6160 JSR COMPARE
6170 LDA 88D
6180 BMI DF1
6190 JSR SSET
6200 JSR SETA
6210 JSR SUBT
6220 INC 884
6230 JMP DR1
6240 .DF1
6250 LDY #0
6260 LDA 884
6270 ASL A
6280 ASL A
6290 ASL A
6300 ASL A
6310 ORA (88E),Y
6320 STA (88E),Y
6330 STY 884
6340 .DR2:JSR SXTP
6350 JSR SATP
6360 JSR COMPARE
6370 LDA 88D
6380 BMI DF2
6390 JSR XSET
6400 JSR SETA
6410 JSR SUBT
6420 INC 884
6430 JMP DR2
6440 .DF2
6450 LDY #0
6460 LDA 884
6470 ORA (88E),Y
6480 STA (88E),Y
6490 STY 884
6500 DEC 870
6510 LDA 870
6520 CMP #8FF
6530 BNE DF3
6540 DEC 871
6550 LDA 871
6560 CMP #818
6570 BNE DF3
6580 LDA #0
6590 STA 870
6600 LDX #819
6610 STX 871
6620 JSR RESETA
6630 JSR ETA
6640 JMP RESETA

```

```

6650 .DF3
6660 DEC 88E
6670 LDA 88E
6680 CMP #8FF
6690 BNE DF4
6700 DEC 88F
6710 .DF4:JMP DR1
6720 \***** EXCHANGE A & T \*****
6730 .ETA:JSR SETT
6740 JSR ASET
6750 JSR EXC
6760 LDA 87F
6770 LDX 873
6780 STA 873
6790 STX 87F
6800 LDA 87E
6810 LDX 872
6820 STA 872
6830 STX 87E
6840 RTS
6850 \***** EXCHANGE \*****
6860 .EXC
6870 LDX #8
6880 LDY #0
6890 .ER1:LDA (880),Y
6900 PHA
6910 LDA (882),Y
6920 STA (880),Y
6930 PLA
6940 STA (882),Y
6950 INY
6960 BNE ER1
6970 INC 881
6980 INC 883
6990 DEX
7000 BNE ER1
7010 RTS
7020 \***** PRINT A REG \*****
7030 .PRA
7040 LDY 872
7050 LDA #0
7060 STA 882
7070 LDA 873
7080 CLC
7090 ADC 871
7100 STA 883
7110 .LBL:LDA (882),Y
7120 PHA
7130 AND #8F0
7140 LSR A
7150 LSR A
7160 LSR A
7170 LSR A
7180 CLC
7190 ADC #830
7200 JSR &FFEE
7210 PLA
7220 AND #8F
7230 CLC
7240 ADC #830
7250 JSR &FFEE
7260 DEY
7270 CPY #8FF
7280 BNE LBL
7290 DEC 883
7300 LDX #819
7310 DEX
7320 CPX 883
7330 BNE LBL
7340 LDA #8D
7350 JSR &FFEE
7360 LDA #10
7370 JSR &FFEE
7380 RTS
7390 \***** EXCHANGE X & A \*****
7400 .EXA:JSR SETX
7410 JSR ASET
7420 JSR EXC
7430 LDA 877
7440 LDX 873
7450 STA 873
7460 STX 877
7470 LDA 876
7480 LDX 872
7490 STA 872
7500 STX 876
7510 RTS
7520 \***** RESET X \*****
7530 .RESETX
7540 LDA #8FF
7550 STA 880
7560 LDA #830
7570 STA 881
7580 LDY #0
7590 LDX #16
7600 JSR R3
7610 BCS RX
7620 LDA 880
7630 STA 876
7640 LDA 881
7650 SEC
7660 SBC 875
7670 STA 877
7680 RTS
7690 .RX:LDA #0
7700 STA 876
7710 STA 877
7720 RTS
7730 .CMD
7740 STA 880

```

Continued ►

MATHS

Continued

```

7750 STX &B1
7760 STY &B2
7770 LDX #&FF
7780 .loop
7790 LDY #&FF
7800 .inner
7810 INY:INX
7820 LDA TABLE,X
7830 BEQ ZERO
7840 CMP (&B1),Y
7850 BEQ inner
7860 .AGAIN
7870 INY:INX
7880 LDA TABLE,X
7890 BNE AGAIN
7900 INY:INX
7910 LDA TABLE,X
7920 CMP #&FF
7930 BEQ EXIT
7940 INY:INX
7950 JMP loop
7960 .EXIT
7970 LDA &B0
7980 LDX &B1
7990 LDY &B2
8000 JMP CLIV
8010 .ZERO
8020 INY:INX
8030 LDA TABLE,X
8040 CMP #&FF
8050 BEQ EXIT
8060 STA &B5
8070 INY:INX
8080 LDA TABLE,X
8090 STA &B6
8100 JMP (&B5)
8110 \***** DIVIDE A BY 100 *****
8120 .DAH:JSR ASET
8130 LDY #16
8140 LDY #0
8150 STY &7E
8160 STA &7F
8170 STA &7F
8180 STA &3900

```

```

8190 .DH1:LDY #1
8200 LDA (&B0),Y
8210 DEY
8220 STA (&B0),Y
8230 INC &B0
8240 BNE DH1
8250 INC &B1
8260 DEX
8270 BNE DH1
8280 LDA #0
8290 STA &28FF
8300 JMP RESETA
8310 \***** A TIMES 10 *****
8320 .ADT:JSR ASET
8330 JSR SHFTLFT
8340 JSR SSET
8350 JSR SETA
8360 JSR EXC
8370 JMP RESETA
8380 .TABLE
8390 EQU "ADD":EQU 0:EQU (ADXA MOD
256):EQU (ADXA DIV 256)
8400 EQU "SUB":EQU 0:EQU (SUXA MOD
256):EQU (SUXA DIV 256)
8410 EQU "MXA":EQU 0:EQU (MXA MOD 2
56):EQU (MXA DIV 256)
8420 EQU "DXA":EQU 0:EQU (DXA MOD 2
56):EQU (DXA DIV 256)
8430 EQU "TXA":EQU 0:EQU (TXA MOD 2
56):EQU (TXA DIV 256)
8440 EQU "TAX":EQU 0:EQU (TAX MOD 2
56):EQU (TAX DIV 256)
8450 EQU "KBI":EQU 0:EQU (KBI MOD 2
56):EQU (KBI DIV 256)
8460 EQU "PRA":EQU 0:EQU (PRA MOD 2
56):EQU (PRA DIV 256)
8470 EQU "ETA":EQU 0:EQU (ETA MOD 2
56):EQU (ETA DIV 256)
8480 EQU "ETA":EQU 0:EQU (ETA MOD 2
56):EQU (ETA DIV 256)
8490 EQU "CXA":EQU 0:EQU (CXA MOD 2
56):EQU (CXA DIV 256)
8500 EQU "CLX":EQU 0:EQU (CLX MOD 2
56):EQU (CLX DIV 256)
8510 EQU "CLA":EQU 0:EQU (CLA MOD 2

```

```

5d):EQU (CLA DIV 256)
8520 EQU "RSA":EQU 0:EQU (RESETA MO
D 256):EQU (RESETA DIV 256)
8530 EQU "RSX":EQU 0:EQU (RESETX MO
D 256):EQU (RESETX DIV 256)
8540 EQU "STR":EQU 0:EQU (STR MOD 2
56):EQU (STR DIV 256)
8550 EQU "DAH":EQU 0:EQU (DAH MOD 2
56):EQU (DAH DIV 256)
8560 EQU "MAT":EQU 0:EQU (ADT MOD 2
56):EQU (ADT DIV 256)
8570 EQU 0
8580 EQU &FF
8590 ]
8600 NEXT
8610 CALL &4100
8620 END

```

```

160 *MXA
170 *SAVE "NUMBER" 1900 28FF
180 REM === INPUT 50 INTO A AND SAVE,
MULTIPLYING BY 50 AND THEN DIVIDING BY
100 IS QUICKER THAN DIVIDING BY 2.
190 *CLA
200 ?&1900=&50
210 *RSA
220 *SAVE "FIFTY" 1900 28FF
230 REM === CALCULATE SQR(2) ****
240 REPEAT
250 D=D+1:PRINT D
260 *CLA
270 *LOAD "ROOT"
280 REM === LOAD APPROX ROOT
290 *RSA
300 *TAX
310 *CLA
320 *LOAD "NUMBER"
330 REM === LOAD NUMBER
340 *RSA
350 *DXA
360 *ADD
370 *TAX
380 *CLA
390 *LOAD "FIFTY"
400 REM === LOAD 50 INTO A
410 *RSA
420 *MXA
430 *DAH
440 *PRA
450 *TAX
460 *CLA
470 *LOAD "ROOT"
480 REM === LOAD PREV APPROX
490 *RSA
500 *CMP
510 *TAX
520 *SAVE "ROOT" 1900 28FF
530 REM === SAVE NEW APPROX
540 UNTIL ?&80=0
550 END

```

Listing 2

```

10 REM Newton's formulae for SQR(2)
20 REM by DJ Cook
30 REM for B/B+/M/C
40 REM (c) BAU May 1990
50 :
60 FOR J=&3900 TO &40FF:J=ASC "0":NE
XT
70 ?&3900=ASC "1"
80 ?&40FF=13
90 *STR
100 REM === SAVE FIRST APPROX OF ROOT
TO DISC
110 *SAVE "ROOT" 1900 28FF
120 *TAX
130 REM === INPUT NUMBER AND SAVE TO D
ISC
140 ?&3900=ASC "2"
150 *STR

```

POTTERY

Listing 1

```

10 REM >BBCGoblet
20 REM by Rob Miller
30 REM for B/B+/M/C/E/A
40 REM (c) BAU May 1990
50 :
60 MODE 2
70 VDU 23;8202;0;0;0;
80 VDU 29,640;0;
90 PROCsetup
100 nshades=8
110 step=(360/(2*nshades))
120 :
130 PROCcylinder(70,220,80,220,2)
140 PROCcylinder(80,220,100,200,2)
150 PROCcylinder(100,200,150,200,2)
160 PROCcylinder(150,30,450,30,1)
170 :
180 FOR R=180 TO 90 STEP -10
190 ew1=SINRAD(R)*250:ew2=SINRAD(R+10)
*250
200 eh1=COSRAD(R)*250:eh2=COSRAD(R+10)
*250
210 PROCcylinder(eh1+700,ew1,eh2+700,e
w2,1)
220 NEXT R
230 :
240 PROCcylinder(700,250,900,225,1)
250 PROCcylinder(900,225,900,215,2)
260 :
270 END
280 :
290 DEF PROCcylinder(eh1,ew1,eh2,ew2,p
al)
300 :
310 FOR D = -90 TO (270-step) STEP ste
p
320 :
330 h1 = ew1/4:h2 = ew2/4
340 x1 = SINRAD(D)*ew1 : y1 = (CO
SRAD(D)*h1)+eh1

```

```

350 x2 = SINRAD(D+step)*ew1 : y2 = (CO
SRAD(D+step)*h1)+eh1
360 x3 = SINRAD(D)*ew2 : y3 = (CO
SRAD(D)*h2)+eh2
370 x4 = SINRAD(D+step)*ew2 : y4 = (CO
SRAD(D+step)*h2)+eh2
380 :
390 IF pal=2 AND D<90 THEN GCOL 0,7-co
l((D+90) DIV step) ELSE GCOL 0,col((D+90
) DIV step)
400 PROCquad(x1,y1,x2,y2,x3,y3,x4,y4)
410 NEXT D
420 :
430 ENDPROC
440 :
450 DEF PROCquad(x1,y1,x2,y2,x3,y3,x4,
y4)
460 MOVE x3,y3:MOVE x1,y1
470 PLOT 85,x4,y4
480 PLOT 85,x2,y2
490 ENDPROC
500 :
510 DEF PROCsetup
520 DIM col(15)
530 FOR I = 0 TO 7
540 READ col%
550 col(1) = col%
560 col(1+8) = col%
570 NEXT I
580 ENDPROC
590 :
600 DATA 0,4,1,5,2,6,3,7

```

```

40 REM (c) BAU MAY 1990
50 :
60 MODE 15
70 OFF
80 ORIGIN 640,0
90 nshades=12
100 step=360/(2*nshades)
110 :
120 PROCcylinder(35,100,40,120,0,1,0,1
)
130 PROCcylinder(40,120,40,120,0,1,0,
1)
140 PROCcylinder(40,120,450,110,0,1,0
,1)
150 PROCcylinder(450,110,500,100,0,1,0
,1)
160 PROCcylinder(500,100,650,40,0,1,0,
2)
170 PROCcylinder(650,40,760,40,0,1,0,1
)
180 PROCcylinder(760,40,770,50,0,1,0,1
)
190 PROCcylinder(770,50,780,50,0,1,0,1
)
200 PROCcylinder(780,50,790,40,0,1,0,2
)
210 END
220 :
230 DEF PROCcylinder(ey1,ew1,ey2,ew2,r
%,g%,b%,pal)
240 :
250 FOR D = -90 TO (270-step) STEP ste
p
260 :
270 red% = (((D+90) DIV 60) MOD 3)+
1)*r%
280 green% = (((D+90) DIV 60) MOD 3)+
1)*g%
290 blue% = (((D+90) DIV 60) MOD 3)+
1)*b%

```

```

300 tint% = ((D+90) DIV 15)*64
310 :
320 IF pal=2 AND D<90 THEN
330 red% = (2-(((D+90) DIV 60) MOD 3
)+1)*r%
340 green% = (2-(((D+90) DIV 60) MOD 3
)+1)*g%
350 blue% = (2-(((D+90) DIV 60) MOD 3
)+1)*b%
360 tint% = 1472-((D+90) DIV 15)*64
370 ENDIF
380 :
390 colour%=(blue%<<4)+(green%<<2)+red
%
400 GCOL colour% TINT tint%
410 :
420 h1 = ew1/4:h2 = ew2/4
430 x1 = SINRAD(D)*ew1 : y1 = (CO
SRAD(D)*h1)+ey1
440 x2 = SINRAD(D+step)*ew1 : y2 = (CO
SRAD(D+step)*h1)+ey1
450 x3 = SINRAD(D)*ew2 : y3 = (CO
SRAD(D)*h2)+ey2
460 x4 = SINRAD(D+step)*ew2 : y4 = (CO
SRAD(D+step)*h2)+ey2
470 :
480 PROCquad(x1,y1,x2,y2,x3,y3,x4,y4)
490 NEXT D
500 :
510 ENDPROC
520 :
530 DEF PROCquad(x1,y1,x2,y2,x3,y3,x4,
y4)
540 MOVE x3,y3:MOVE x1,y1
550 PLOT 85,x4,y4
560 PLOT 85,x2,y2
570 ENDPROC

```

Listing 2

```

10 REM >ArcBottle
20 REM by Rob Miller
30 REM for Arc only

```

Listing 1

```

10 REM >CopyDFS
20 REM By David Lawrence
30 REM For Archimedes only
40 REM (c) BAU 1990
50 :
60 ON ERROR PROCError:GOTO 90
70 MODE 12:OFF
80 PROCinit
90 REPEAT
100 prefix$ = FNvariables
110 PROCsetparams
120 PROCcopydisc(prefix$)
130 UNTIL FALSE

```

```

140 END
150 :
160 DEF PROCinit
170 Single = 0
180 Double = 1
190 One = 0
200 Two = 1
210 Multi = 2
220 Both = 2
230 Dest = 6
240 delete = 6
250 cdir = 8
260 error = FALSE

```

```

270 old = 0
280 new = 0
290 READ vars,defs
300 DIM var$(vars),opts(vars),pos(vars
),opts$(vars,4),defs(defs,vars)
310 FOR var = 0 TO vars - 1
320 READ var$(var),opts(var)
330 FOR opt = 0 TO opts(var)-1
340 READ opts$(var,opt)
350 NEXT
360 PROCdo(var,0)
370 NEXT
380 set$ = ""

```

```

390 FOR def = 0 TO defs - 1
400 READ let$
410 set$ += let$
420 FOR var = 0 TO vars - 1
430 READ defs(def,var)
440 NEXT
450 NEXT
460 free = HIMEH - END - 88000
470 DIM block 64,cat &200,space free
480 *FX 4 1
490 COLOUR 14,860,860,860
500 PROCbox(15,15,64,1)
510 PROCset(1)

```

Continued ►

DISCS

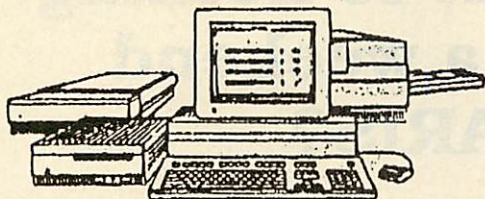
Continued

```

520 ENDPROC
530 :
540 DEF PROCset(num)
550 FOR var = 0 TO vars - 1
560   pos(var) = defs(num,var)
570   PROCdo(var,0)
580 NEXT
590 do = TRUE
600 ENDPROC
610 :
620 DEF PROCerror
630 IF REPORT$ = "Escape" THEN
640   IF INKEY-1 THEN
650     MODE 12
660   ELSE
670     ENDPROC
680   ENDIF
690 ELSE
700   MODE 12
710   PRINTCHR$13;REPORT$; " (";ERR;")
at line " ; ERL
720 ENDIF
730 END
740 :
750 DEF FNnaughty(err$)
760 PROCbox(38-LENerr$/2,20,42+LENerr$/2,18)
770 COLOUR 128:COLOUR 1
780 PRINTTAB(40-LENerr$/2,19);err$;
790 VDU 7
800 error = TRUE
810 = FALSE
820 :
830 DEF PROCwipe
840 VDU 17,128,28,0,31,79,17,12,26
850 error = FALSE
860 ENDPROC
870 :
880 DEF PROCdo(line,col)
890 COLOUR 6
900 COLOUR 128+col
910 PRINTTAB(18,line*2+2); " ";var$(lin
e); " ";TAB(37,line*2+2);
920 COLOUR 128
930 FOR opt = 0 TO opts(line)-1
940   COLOUR 128
950   IF opt = pos(line) THEN
960     COLOUR 7
970     IF col = 1 COLOUR 129
980   ELSE
990     COLOUR 14
1000  ENDIF
1010  PRINT " ";RIGHT$(opts$(line,opt)
,20); " ";
1020  IF line = Dest THEN
1030    len = 20 - LEN(opts$(line,opt)
)
1040    IF len < 0 len = 0
1050    PRINTSPClen;STRING$(len+2,CHR$
8);
1060  ENDIF
1070 NEXT
1080 ENDPROC
1090 :
1100 DEF PROCbox(x1,y2,x2,y1)
1110 MOVE x1*16-8, (31-y2)*32-8
1120 DRAW (x2*16-8, (31-y2)*32-8
1130 DRAW (x2*16+4, (32-y1)*32+4
1140 DRAW x1*16-8, (32-y1)*32+4
1150 DRAW x1*16-8, (31-y2)*32-8
1160 DRAW x1*16-24, (31-y2)*32-24
1170 DRAW (x2*16)*16+20, (31-y2)*32-24
1180 PLOT 1,-16,16:PLOT 0,16,-16
1190 DRAW (x2*16)*16+20, (32-y1)*32+20
1200 PLOT 1,16,-16:PLOT 0,-16,16
1210 DRAW x1*16-24, (32-y1)*32+20
1220 PLOT 1,16,-16:PLOT 0,-16,16
1230 DRAW x1*16-24, (31-y2)*32-24
1240 ENDPROC
1250 :
1260 DEF FNvariables
1270 done = FALSE
1280 PROCwipe
1290 REPEAT
1300   REPEAT
1310     IF old < new PROCdo(old,0)
1320     PROCdo(new,1)
1330     IF new = Dest ON ELSE OFF
1340     old = new
1350     do = FALSE
1360   REPEAT
1370     key = GET
1380   OFF
1390   IF error PROCwipe
1400   IF new = Dest THEN
1410     PROCtext(opts$(Dest,0),key
) : do = TRUE
1420   ELSE
1430     set = INSTR(set$,CHR$key)
1440     IF set > 0 THEN
1450       PROCset(set - 1) DIV 2
1460     do = TRUE
1470   ENDIF
1480   ENDIF
1490   CASE key OF
1500     WHEN 136 : PROCadd(new,-1)
1510     WHEN 137 : PROCadd(new,1)
1520     WHEN 138 : new = (new + 1)
MOD vars
1530     WHEN 139 : new = (new + va
rs - 1) MOD vars
1540     WHEN 13 : done = TRUE
1550   ENDCASE
1560   UNTIL new < old OR done OR do
1570   UNTIL done
1580   path$ = opts$(Dest,0)
1590   IF pos(0) = 1 THEN
1600     SYS "XOS_File",5,path$ TO type
; flag
1610   CASE type OF
1620     WHEN 0 : done = FNcreate(pat
h$ + ".")
1630     WHEN 1 : done = FNnaughty("N
ot a directory")
1640   ENDCASE
1650   IF (flag AND 1) done = FNnaugh
ty("Bad directory name")
1660   IF done = FALSE new = Dest
1670   ENDIF
1680   UNTIL done
1690   PROCdo(old,0)
1700   OFF
1710   path$ = path$ + "."
1720 :
1730   DEF PROCadd(line,val)
1740   pos(line) = (pos(line) + opts(line
) + val) MOD opts(line)
1750   PROCdo(line,1)
1760   ENDPROC
1770 :
1780   DEF PROCtext(RETURN a$,key)
1790   IF key = 127 THEN
1800     IF LENA$ > 0 a$ = LEFT$(a$)
1810   ELSE
1820     IF key > 31 AND key < 127 a$ += C
HRSkey
1830   ENDIF
1840   ENDPROC
1850 :
1860   DEF FNcreate(dir$)
1870   IF FNnaughty("Create Sub-directorie
s")
1880   ON
1890   yes = FNyorn
1900   OFF
1910   PROCwipe
1920   IF yes THEN
1930     sub = 0
1940   REPEAT
1950     sub = INSTR(dir$,".",sub + 1)
1960     IF sub < 0 THEN
1970       sub$ = LEFT$(dir$,sub - 1)
1980       SYS "OS_File",5,sub$ TO type
1990       IF type = 0 THEN
2000         SYS "OS_File",cdir,sub$
2010       ENDIF
2020     ENDIF
2030     UNTIL sub = 0
2040     = TRUE
2050   ENDIF
2060   = FALSE
2070 :
2080   DEF FNyorn
2090   REPEAT
2100     yorn = INSTR("YyNn",GET$)
2110   UNTIL yorn < 0
2120   = (yorn < 3)
2130 :
2140   DEF PROCsetparams
2150   Copy = (pos(0) = 1)
2160   Drive = FNval(1)
2170   Density = pos(2)
2180   Tracks = FNval(3)
2190   Catalog = pos(4)
2200   Side = pos(5)
2210   Bytes = 256
2220   IF Density = Single THEN
2230     Sectors = 10
2240   Record = FNsetblock(Bytes,Secto
rs,Tracks)
2250   ELSE
2260     Sectors = 16
2270   Record = 0
2280   ENDIF
2290   ENDPROC
2300 :
2310   DEF FNval(n)
2320   = VAL(opts$(n,pos(n)))
2330 :
2340   DEF PROCcopydisc(root$)
2350   FOR side = 0 TO 1
2360     IF Side = side OR Side = 2 THEN
2370       ptr = 0
2380     PROCreadcat
2390     PROCshowcat
2400     IF Copy THEN
2410       PROCcopycat(root$)
2420     ELSE
2430       VDU 7
2440       IF GET
2450       ENDIF
2460     ENDIF
2470   NEXT
2480   ENDPROC
2490 :
2500   DEF PROCreadcat
2510   track = 0
2520   sector = 0
2530   files = 0
2540   REPEAT
2550     PROCread(side,track,sector,&200,
cat,Record)
2560     IF track = 0 AND sector = 0 THEN
2570       cycle = cat*2*104
2580       opt = (cat*2*106 DIV 16)
2590       size = (cat*2*106 AND &F)*256+
(cat*2*107)
2600     ENDIF
2610     num = cat*2*105 DIV 8
2620     FOR file = 1 TO num
2630       file$ = ""
2640       FOR off = 0 TO 7
2650         char = cat*(file*8+off)
2660         char$ = CHR$(char AND &7F)
2670       CASE char$ OF
2680         WHEN " " : char$ = " "
2690         WHEN " " : char$ = " "
2690         WHEN " " : char$ = " "
2700         WHEN " " : char$ = " "
2710         WHEN " " : char$ = " "
2720         WHEN " " : char$ = " "
2730         WHEN " " : char$ = " "
2740       NEXT
2750       file$ = RIGHT$(file$) + "." +
LEFT$(file$)
2760       IF file$ < "2.?????" AND AS
C(files) < 127 THEN
2770         load$ = FNtwo(&100)
2780         exec$ = FNtwo(&102)
2790         size$ = FNtwo(&104)
2800         addr$ = FNtwo(&106)
2810         addr$ = (addr$ AND &FF)<<8 O
R (addr$ AND &FF00)>>8
2820         IF addr$ AND (1<<15) load$ =
load$ OR &FFFF0000
2830         IF addr$ AND (1<<14) exec$ =
exec$ OR &FFFF0000
2840         PROCstore(files,load$,exec$,
size$,addr$ AND &3FFF)
2850         files += 1
2860       ENDIF
2870     NEXT
2880     CASE Catalog OF
2890       WHEN One:
2900         next = 0
2910       WHEN Two:
2920         IF track = 0 AND sector = 0
THEN
2930           next = 2
2940         ELSE
2950           next = 0
2960         ENDIF
2970       WHEN Multi:
2980         next = (cat*2*102 AND &F)*256
+ (cat*2*103)
2990     ENDCASE
3000     IF next < 0 THEN
3010       track = next DIV Sectors
3020       sector = next MOD Sectors
3030     ENDIF
3040     UNTIL next = 0
3050   ENDPROC
3060 :
3070   DEF FNtwo(off$)
3080   = cat*(file*8+off$) + 256 * cat*(f
ile*8+off$+1)
3090 :
3100   DEF PROCstore(fs,lx,e$,s$,ax)
3110   IF ptr > free ERROR 0,"Out of memo
ry"
3120   mem = space + ptr
3130   $mem = fs
3140   mem:10 = lx
3150   mem:14 = e$
3160   mem:18 = s$
3170   mem:22 = ax
3180   ptr += 26
3190   ENDPROC
3200 :
3210   DEF PROCget(n$,RETURN fs$,RETURN lx
$,RETURN e$,RETURN s$,RETURN ax)
3220   mem = space + n$ * 26
3230   fs = $mem
3240   lx = mem:10
3250   e$ = mem:14
3260   s$ = mem:18
3270   ax = mem:22
3280   ENDPROC
3290 :
3300   DEF PROCshowcat
3310   PROCwipe
3320   COLOUR 7
3330   COLOUR 129
3340   PRINTTAB(28,17); " Side : ";side;"
Files : ";files;" "
3350   COLOUR 128
3360   FOR file = 0 TO files - 1
3370     PROCget(file,files$,xx$,xx$,xx$,xx)
3380     PROCname(file,files$,7)
3390   NEXT
3400   ENDPROC
3410 :
3420   DEF PROCname(num,txt$,col)
3430   COLOUR col
3440   IF num < 104 PRINT TAB(10*(num MOD
8),18*(num DIV 8));txt$
3450   ENDPROC
3460 :
3470   DEF PROCcopycat(dir$)
3480   buffer = space + ptr
3490   IF Side = Both THEN
3500     dir$ += "Side" + STR$side + "."
3510     SYS "OS_File",cdir,LEFT$(dir$)
3520   ENDIF
3530   last$ = ""
3540   file = 0
3550   REPEAT
3560     REPEAT
3570       ok = TRUE
3580       PROCget(file,files$,load$,exec$
,size$,addr$)
3590       IF ptr + size$ > free ERROR 0,
"Out of memory"
3600       track = addr$ DIV Sectors
3610       sector = addr$ MOD Sectors
3620       PROCname(file,files$,2)
3630       PROCread(side,track,sector,siz
e$,buffer,Record)
3640       PROCname(file,files$,1)
3650       dfsdir$ = LEFT$(file$,1)
3660       IF dfsdir$ = "$" THEN
3670         save$ = MIDS$(file$,3)
3680       ELSE
3690         SYS "XOS_File",cdir,dir$ + d
fsdir$ TO ; flag
3700       IF (flag AND 1) THEN
3710         PROCmore
3720         ok = FALSE
3730       ELSE
3740         save$ = file$
3750       ENDIF
3760     UNTIL ok
3770     SYS "XOS_File",0,dir$ + save$,lo
ad$,exec$,buffer,buffer,size$ TO ; flag
3780     IF (flag AND 1) THEN
3790       PROCmore
3800     ELSE
3810       PROCname(file,files$,7)
3820       file += 1
3830       last$ = dir$ + save$
3840     ENDIF
3850   UNTIL file = files
3860   ENDPROC
3870 :
3880   DEF PROCmore
3890   IF last$ = "" THEN
3900     ERROR 0,"Directory full"
3910   ELSE
3920     PROCname(file,files$,6)
3930     SYS "OS_File",delete,last$
3940     dir$ += "!"More.
3950     SYS "OS_File",cdir,LEFT$(dir$)
3960     file += 1
3970   ENDIF
3980   ENDIF
3990   ENDPROC
4000 :
4010   DEF FNsetblock(bytes$,sectors$,tra
cks$)
4020   FOR ix = 0 TO 63
4030     ix:2:block = 0
4040   NEXT
4050   block:20 = LOG(bytes$) / LOG(2)
4060   block:21 = sectors$
4070   block:22 = 1
4080   block:23 = 1
4090   block:16 = bytes$ * sectors$ * tra
cks$ * 2
4100   = block
4110 :
4120   DEF PROCread(side$,track$,sector$,
num$,addr$,block$)
4130   disc$ = Bytes * (sector$ + track$*
Sectors + side$*Sectors*Tracks)
4140   SYS "ADFS_DiscOp",((block$ DIV 4)
<<8) OR 1,disc$ OR (Drive<<29),addr$,num
$
4150   ENDPROC
4160 :
4170   DATA 7,3
4180 :
4190   DATA Operation, 2, Catalog,Copy
4200   DATA DFS Drive, 4, 0,1,2,3
4210   DATA Density, 2, Single,Doubl
e
4220   DATA Tracks, 2, 40,80
4230   DATA Catalog, 3, 0,1,Both
4240   DATA Side, 3, 0,1,Both
4250   DATA Destination, 1, adfs:4.$Te
mp
4260 :
4270   DATA Aa, 1,1,0,1,0,2,0 : REM Com
4280   DATA Ss, 1,1,1,2,2,0 : REM Solid
isk
4290   DATA Ww, 1,1,0,1,1,2,0 : REM Watfo
rd?

```


KENDAL COMPUTER CENTRE



- ☆ New Archimedes Accounting Program now available, the professional solution
- ☆ Dealer enquiries welcome
- ☆ Home Business & education systems
- ☆ Word processing from £299+VAT
- ☆ Accounting & payroll systems from £999+VAT
- ☆ Entertainment & business software always in stock
- ☆ Full repair service – Training available

68 Stramongate, Kendal Cumbria
Tel: (0539) 722559



BBD
○ DUST ○
COVERS

**PROFESSIONAL
COVERS FOR THE
BBC MICRO RANGE**

BBD
○ DUST ○
COVERS

DIRECT FROM THE LEADING MANUFACTURER

Tailored from the best quality ivory coloured nylon that has been coated with polyurethane to which an anti-static inhibitor has been added. These fabric covers are tastefully finished with brown piping. They are washable and can be ironed with a cool iron.

COVERS FOR THE FOLLOWING COMPUTERS

ARCHIMEDES.....	£10.50
ACORN A3000 (keyboard).....	£5.00
with Monitor.....	£10.50
BBC COMPACT SET.....	£10.50
(Please state whether colour or monochrome monitor.)	
BBC MASTER.....	£5.00
BBC B/B+.....	£5.00

MATCHING COVERS FOR PRINTERS, MONITORS AND DISC DRIVES

A large range of covers for printers, monitors and disc drives are available to match the computer covers.

PRINTERS COVERS FROM.....	£5.50
MONITOR COVERS FROM.....	£6.50
DISC DRIVE COVERS FROM.....	£3.50

If you have a specific requirement please do not hesitate to contact us as we will be delighted to help.

Prices include VAT and First Class Postage. All our covers are unconditionally guaranteed. Please make cheques out to:



BBD Computer Dust Covers
Dept. 64 The Standish Centre
Cross Street
Standish, Wigan WN6 0HQ



Callers and Dealer inquiries welcome

TEL: 0257 425839 ext 64 FAX: 0257 423909



Archimedes Software

Tools#1	£10	FastROM HardReset BEEdit Shell BigMode
Tools#2	£10	DiscTree MouseModule FileFinder DisAssembler
Tools#3	£10	BootFileGenerator Setup AutoMount AssRoutines
Paint 16	£10	WatfordDigitiser 3D-Part Magnifier Colour Statistic
Paint 256	£129	RiscOsApp Scanners Digitisers(Arvis-Watford) advancedKeyCommands
Macro Assembler	£59	comingsoonaskforit!
DemoDisc	£0	please send us a SAE



G.M.A. mbH Wandsbeker Chaussee 58

2000 Hamburg 76 West Germany Tel: 01049-40-2512415, Fax: 01049-40-2502660

BASIC MUSIC COMPOSITION PROGRAM FOR THE BBC MODEL B 40/80 TRACK

Fantastic value for money is offered by this computer program and its informative manual, enabling pupils (age range 8 to adults), to compose their own music using harmony notes, passing notes and rests. It allows the choice of three musical keys and two time signatures. Music is played back with full harmonies giving a choice of instruments and tempos. A hard copy of the music can be printed and played by the whole class using any combination of instruments. As no specialist knowledge is needed of computers or music, this program is suitable to be used by the Classroom, "IT" or Specialist Music Teacher, along with pupils and private individuals at home.

Price £17.35 + VAT and Carriage

For ordering, or to receive further information please contact:

TOBIN MUSIC

The Malt House · Knight Street · Sawbridgeworth
Hertfordshire · CM21 9AX · Telephone 0279 726625



BBC ACORN USER MAY 1990

Ask for our
Archway 4GL
catalogue

V1.2
RISC OS
ONLY



ARCHWAY 4GL lets YOU unleash the huge program power of RISC OS and the ARM easily and quickly. Build powerful multi-window applications with pop-up menus, icons, mouse control, etc. of a professional quality. Programs are fully RISC OS multi-tasking and appear on the icon bar. All using BBC BASIC.

ARCHWAY 4GL provides a total environment for program creation including tools, shell program with run-time code, extensive examples and a library of functions and procedures.

An in-depth user guide takes you gently step-by-step through a progressive series of some 50 program building sessions from complete beginner to advanced level. All examples are on disc ready to run.

The complete system (V1.2) comes on 4*800k discs with a 500-page ring bound user guide. You need an Archimedes or A3000 with 1M or more of RAM and fitted with RISC OS. One disc drive is sufficient. There is no extra licence fee to distribute copies of the run-time in your programmes.

"You get an excellent piece of software which will make the mountain of programming needed to operate the WIMP environment into a molehill!"
— Archive, July 1989

"Archway is one of the most impressive and best value-for-money products that I have yet seen for the Archimedes... anyone who wishes to write RISC applications in BASIC 5 would have to be quite insane NOT to enlist the aid of this remarkable package!"
— A&B Computing, February 1990



SIMTRON

Programs to help you

£99.95

incl. VAT & p/p

4 CLARENCE DRIVE, EAST GRINSTEAD,
WEST SUSSEX RH19 4RZ Telephone (0342) 328188



Cheques/POs/official orders or Access/Visa number and expiry date. 24-hour phone for Credit Card orders.



**Why are we giving away up to
24,000 copies of
FRENCH ON THE RUN
worth £9.95 for next to nothing
AND giving away a weekend
for two in PARIS?**

As part of our market research plans we need to know just how many readers of this magazine will respond to such an incredible offer.

To receive your ***French On The Run*** cassette, simply fill in the order form below and send it to us, enclosing two £1 coins to cover post, packaging and handling, and we'll mail your tape within 48 hours. You will also be placed on our mailing list, unless you tick the box requesting us not to do so.

French On The Run is a superb real-life simulation of an adventure set in wartime France. You're a British pilot shot down over France in 1941. Your task is to return to England without being caught by the German occupying forces.

To achieve this you'll have to overcome numerous obstacles, taking care to establish who is friend and who is foe. To an extent the quality of your French will determine how successful you are but, the more you play, the more your French will improve.

Remember, 1992 is just around the corner so this could be the ideal way to either brush up your French or learn a bit more.

PLUS the first person who completes the game and cracks the coded message will receive a free weekend for two in Paris with all expenses paid, worth a total of £300! So don't delay, send for your tape today!

AND YOU DON'T EVEN NEED A STAMP!

Please note: This offer is valid only until April 30th 1990

PLEASE WRITE CLEARLY AND IN BLOCK CAPITALS

I claim my BBC FRENCH ***French On The Run*** cassette and enclose two £1 coins to cover post, packaging and handling.

Name _____

Address _____

_____ Post Code _____

Send to:
Swift Software,
FREEPOST,
Ellesmere Port,
South Wirral,
L65 3EE

{ } Tick this box if you don't wish to be included on our mailing list

EXCLUSIVE!

Open the door to Minitel

Minitel - France's Teletel videotex system - is the most successful on-line network ever. It offers many thousands of separate services ranging from education to booking train and plane tickets, international finance to regional site-seeing, leisure activities to business opportunities and so much more.

Its five million regular users spend tens of millions of hours on it each year, dwarfing any other system - anywhere in the world.



Connect time costs you from just 15p* per minute (the normal price for calling France is 35p per minute cheap rate and 46p per minute standard rate!), while the software is just £49.95, including full documentation and a 120 page Minitel directory detailing (in English) hundreds of the most frequently used services and how to access them.

Do you ever get bored with the English videotex systems and find them lacking in variety? Why not try Minitel? For just 15p per minute there's so much there you could well find you spend more time logging on to Minitel than any other system. Order your copy today using the form below (remember, you don't need a stamp), or call our Credit Card Hotline on 051 357 2860.

* From 7p per minute on-line time, plus 8p per minute for PSS or Mercury.

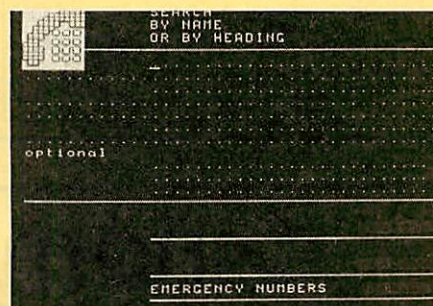
On-line time is provided by Aldoda International. Full details are include in each package.

Compatible with any BBC Micro or Acorn Master with any Viewdata (1200/75) or 1200 baud full duplex modem. This offer is available only in the UK. Despatch is normally within 48 hours but please allow up to 28 days delivery



And now Minitel is available in the UK via MinitelNet, which turns your BBC Micro into a fully functional Minitel workstation with direct connection to Paris.

The software program "T" is a complete emulation of the standard Minitel terminals. You can wander around the system, chat to other users (in French and often in English), find the information you need and capture it to disc.



ORDER FORM

AUS

Please send me my copy of "T" the Minitel terminal emulator for just £49.95 on the following format:
(Please tick/complete all relevant boxes and sections).

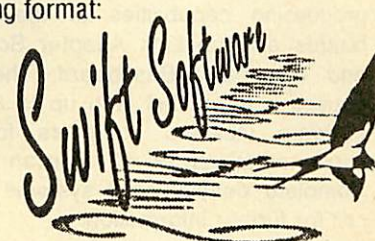
- ☐ 40T Disc ☐ 80T Disc (Discs are for sideways ram) ☐ 16k Rom
☐ I enclose a Cheque/PO made payable to Swift Software.

☐ Access/Visa No. / Expiry Date /

Name Company (If applicable)

Address

Post Code Daytime Tel.



**MU5
FREEPOST
Ellesmere Port
South Wirral L65 3EE**

Credit Card Hotline: 051 357 2860

5 1/4" BENCHMARK DISKS AND BOX OFFERS

25 5 1/4" DS/DD + 100 cap box	£13.62
50 5 1/4" DS/DD + 100 cap box	£20.24
75 5 1/4" DS/DD + 100 cap box	£26.28
100 5 1/4" DS/DD + 100 cap box	£31.50
All disk 100% certified & guaranteed	
All boxes inc. locks & dividers	

3 1/2" BENCHMARK DISKS AND BOX OFFERS

20 3 1/2" DS/DD + 100 cap box	£20.00
40 3 1/2" DS/DD + 100 cap box	£34.50
50 3 1/2" DS/DD + 100 cap box	£40.00
70 3 1/2" DS/DD + 100 cap box	£54.00
All disk 100% certified & guaranteed	
All boxes inc. locks & dividers	

3 1/2" BENCHMARK DS/DD 135 TPI

25	£17.80
50	£34.80
100	£63.80
200	£117.88
400	£223.68

5 1/4" BENCHMARK DISKS DS/DD 48/96

25	£10.64
50	£17.25
100	£29.90
200	£54.00
400	£124.00

DISK BOX SPECIAL

inc. locks and dividers

3 1/2" 50 capacity	£5.25
3 1/2" 80 capacity	£6.50
5 1/4" 50 capacity	£4.95
5 1/4" 100 capacity	£6.50

3 1/2" BENCHMARK DISKS DS/HD HIGH DENSITY

25	£32.00
50	£58.00
100	£106.00
200	£199.00
400	£370.00

UNBRANDED DISKS 100% CERTIFIED & GUARANTEED

5 1/4" DS/DD	5 1/4" DS/HD	3 1/2" DS/DD	3 1/2" DS/HD
100 £27.00	100 £50.00	100 £47.00	100 £95.00
200 £49.00	200 £94.00	200 £94.00	200 £180.00
400 £93.00	400 £170.00	400 £173.00	400 £357.00
600 £139.00	600 £260.00	600 £249.00	600 £518.00
800 £178.00	800 £330.00	800 £320.00	800 £670.00
1000 £215.00	1000 £375.00	1000 £387.00	1000 £812.00

ALL OUR DISKS HAVE A LIFETIME WARRANTY. DISKS ARE SUPPLIED WITH USER LABELS.

DATA SWITCHES

For use with all computers

2 way 36 pin	£14.50
2 way 25 pin D-type	£12.50
X-over 36 pin Cent.	£19.22
X-over 25 pin D-type	£18.22

All metal case with rotary switch

ALL PRICES INCLUDE VAT & P&P UK AND BFPO ORDERS ONLY

**M
C
S**

Cheques & Postal Orders to:

Manor Court Supplies Ltd

Telephone: 0597 87 792

24 Hours Orderline: 0597 87 784

Fax No: 0597 87 784

DEPT AU5, GLEN CELYN HOUSE, PENYBONT, LLANDRINDOD WELLS, POWYS, LD1 5SY

EDUCATION AND GOVERNMENT ORDERS WELCOME

Gnome

ARM3 Upgrade

- ARM3 at 30MHz
- 16k Dhrystones/sec
- 2-5 times speedup
- User installable
- Price £495+VAT

8MB Memory Upgrade

- Upgrades 4MB machines to 8 MB
- RISC OS & RISC iX compatible
- Price £950+VAT

We can supply complete Archimedes systems with these upgrades fitted. Please call for pricing.

Transputer Development Systems

Gnome supplies a range of add-on boards for the Archimedes which allow the user to harness the parallel processing capabilities of the Inmos Transputer. The boards are the Link Adapter Board, TRAM Motherboard and Transputer Baseboard. The Transputer Baseboard houses a transputer with up to 8MB of memory. Support software includes compilers for Occam and parallel implementations of C, Fortran, Pascal and Modula-2. Complete development systems start at £1400. Please call for further information.

Gnome Computers Ltd
16 Histon Road
Cambridge
CB4 3LE

Telephone: 0223 461520

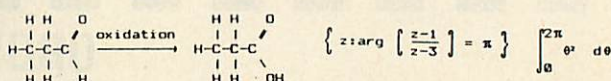
Sciways for Scientists

- * Over 350 defined characters accessible with simple 2-key codes
- * All characters printable on both screen and printer
- * User defined characters can be stored on disc
- * All facilities can be used with word processors or with BASIC
- * Tested with BASIC I & II, Wordwise, Wordwise Plus, View 2.1, View 3.0, on the Master 128, B+ & Model B, and with Epson /compatible printers

GREEK ALPHABET: Upper and lower case, upright and italic

Α Β Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν Ξ Ο Π Ρ Σ Τ Υ Φ Χ Ψ Ω

SCIENTIFIC CHARACTERS: Mainly mathematical but also chemical symbols



See Review in April 1988 Acorn User

"first class product - nobody should be without it"

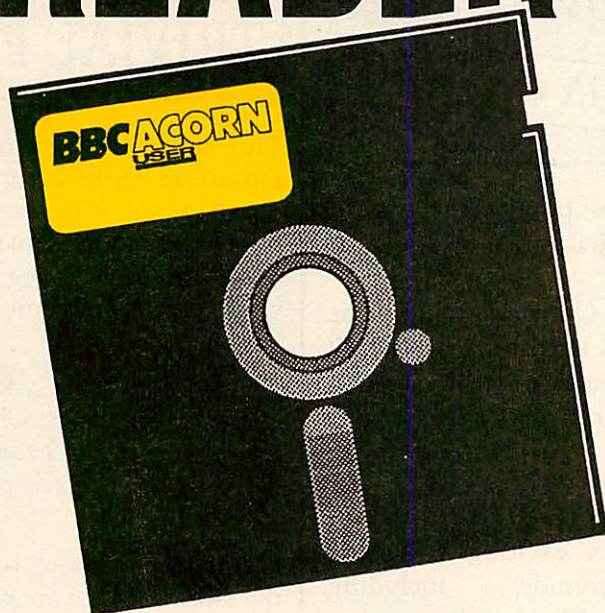
Orders accepted from schools, colleges, establishments, etc.
Private orders - cheque with order, please

PRICE £39.95 inc. VAT, p & p
16k ROM, 40/80 disc & manual
(not compatible with Inter-Word)

Mayhew Telonics,
376a Ringwood Road,
Poole, Dorset BH12 3LT
TEI: (0202) 747 695

BBC ACORN **USER**

READER OFFERS



OFFER OF THE MONTH

You know how quickly you can go through floppy discs, so here's a special offer that will keep you stocked up for a good while – and save you money.

For this month's special we are offering either 50 5.25in or 25 3.5in *BBC Acorn User* branded floppy discs, including sleeves and blank labels with the *BBC Acorn User* logo, for only £19.95.

But please remember that this is a strictly limited offer which will only be available until Thursday the 31st of May 1990.

So don't miss out on this bargain offer, place your order today!

ONLY £19.95

50 5.25in discs or 25 3.5in discs

EXTENDED UNTIL 31st MAY 1990 DUE TO POPULAR DEMAND

Please order using the order form.

G A M E S

PLAY IT AGAIN SAM

BUY TWO GET ONE FREE!

That's right, with every two Play It Again Sam tapes or discs you buy, we'll send you another of your choice — **ABSOLUTELY FREE!**

Buy four and we'll give you another two, or buy seven and we'll send you the lot. That's all 11 Sams for the price of only seven!

Remember, The more you buy, the more you save. So what are you waiting for? Order your compilations today!

THE CAST

Sam1 — Citadel, Thrust, Stryker's Run, Ravenskull

Sam2 — Repton 3, Craze Rider, Galaforce, Codename Droid

Sam3 — Commando, Place of Magic, Killer Gorilla, Killer Gorilla 2

Sam4 — Frak, Spellbinder, Cosmic Camouflage, Grand Prix Construction Set (BBC), Guardian (Electron)

Sam5 — Imogen, Elixir, Bug Blaster, Fortress (BBC), Moonraider (Electron)

Sam6 — Galaforce 2, Hunchback, Hopper, The Sentinel (BBC), Video's Revenge (Electron)

Sam7 — Firetrack, Boncruncher, Snapper, Ghouls

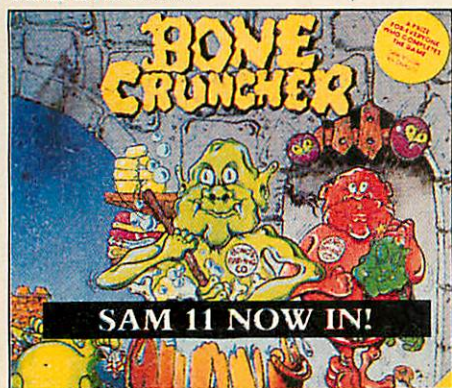
Sam8 — Winter Olympiad 88, Quest, Around The World In 40 Screens, Mr. Wiz

Sam9 — Camelot, Steve Davies Snooker, Spycat, The Life Of Repton

Sam10 — Repton Thru Time, 3D Dotty, Zalaga, Qwak

Sam11 — Barbarian, Pipeline, Baron, Monsters

Cassette £9.95, 5.25in Disc £11.95, 3.5in Disc £14.95



CAN YOU BEAT THE SPORTS PROFESSIONALS AT THEIR OWN GAME?

QUESTION OF SPORT

Play TV's most popular sports quiz, for less than half price!

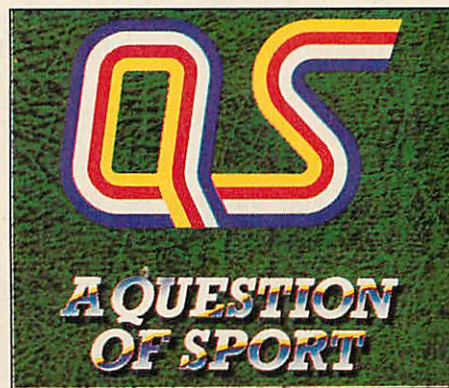
With David Coleman asking the questions and Ian Botham and Bill Beaumont heading up the teams, you can pit your wits against your family and friends, or even challenge your BBC micro.

There are six exciting and fast-moving rounds, including Pictureboard, Mystery Personality and a Quickfire round.

If you've always fancied yourself as a bit of a sports fanatic, this is the program that will thoroughly test your knowledge.

Order your copy today and see if you can beat the professionals at their own game.

	Tape	5.25in	3.5in
RRP	£12.95	£14.95	£19.95
BAU Discount	£6.50	£7.50	£10
Offer Price	£6.45	£7.45	£9.95



ALL THREE TRIVIAL PURSUIT AT A TRIVIAL PRICE!

The computer version of *Trivial Pursuit* is faithful to the original board game. The object being to travel around the board answering questions and trying to collect a wedge for each of the six subjects.

The questions are asked by a cute character called TP, while the screen layout shows the board along with the progress of each player.

Don't worry about running out of questions. There are enough in this set to keep you wracking your brains through many sessions.

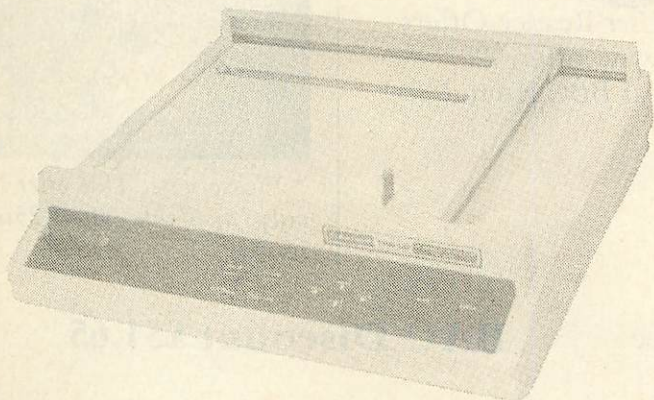
And for as little as £14.95 we'll send you the complete set of Trivial Pursuit games, including Genus, Baby Boomer and Young Players.

	Cassette	5.25in Disc
RRP	£44.85	£59.85
BAU Discount	£29.90	£39.90
Offer Price	£14.95	£19.95



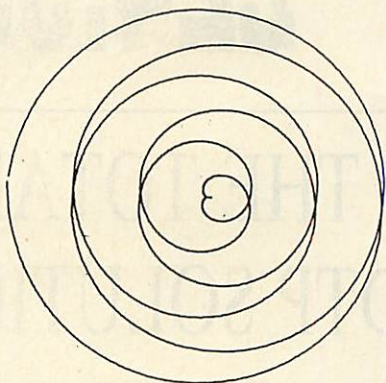
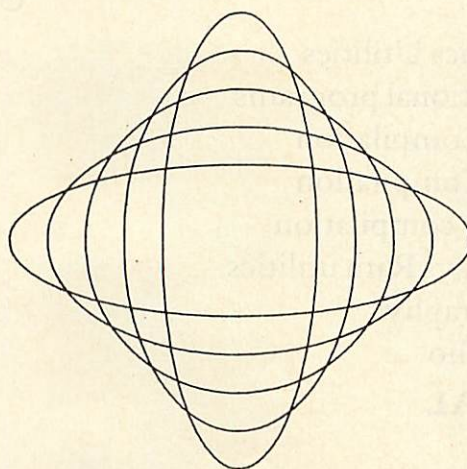
HARDWARE

SAVE £400!



Do we have a real scoop for you? . . .
We have secured exclusive rights to offer the last few remaining Tandy FP215 Flatbed Plotters at an incredible saving of £400!

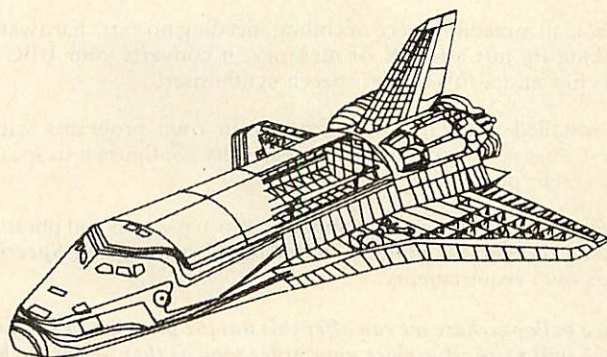
We can do this because, although they are superb pieces of equipment, there are only 80 of them left. This offer is therefore on a strictly first come, first served basis.



If you wish to order yours over the phone, or reserve one prior to ordering by post, please call our mail order hotline on: 0672 40825.

Specifications

- ★ Built-in parallel and serial interfaces
- ★ Easy connection to most computers
- ★ Comprehensive instruction set
- ★ Simply controlled from Basic
- ★ Full A4 size plotting area
- ★ High quality hard copy for reports
- ★ Will produce transparencies
- ★ Internally processes down to 0.05mm
- ★ Vertical or horizontal printing/plotting
- ★ The ideal companion for CAD programs



RRP £699
BAU Discount £400

Offer Price £299

Please order using the form.

UTILITIES



As a special introduction to the new *BBC Acorn User Reader Offers* section we have put together a sensational 'give away' offer. For just **£24.95** you can have eight of the most popular *BBC Acorn User* compilation discs, worth a total of **£76.60***. That's a massive saving of **£51.65!**



* Please note: This offer is only available on 5.25in format

	Usual Price
Graphics Utilities	£ 8.95
Educational programs	£ 8.95
1987 Compilation	£ 7.95
1988 Compilation	£ 7.95
Games compilation	£ 9.95
Sideways Ram utilities	£10.95
Calligraphy	£10.95
Portfolio	£10.95
TOTAL	£76.60

BAU Discount £51.65

OFFER PRICE
£24.95

NOW YOUR BBC MICRO CAN TALK BACK FOR AS LITTLE AS £4.95!

Speech! is an incredible piece of coding, needing no extra hardware and taking up just a few K of memory, it converts your BBC's sound chip into a full-blown speech synthesiser!

Once installed you can call it from your own programs with simple-to-use commands. Plus you can fully configure it to speak in any accent or pitch.

And you can teach it how to pronounce unusual words and phrases — adding them to the built-in dictionary — customising *Speech!* to your own requirements.

Due to a bulk purchase we can offer this unique program to you for less than half price. But place your order soon as they're sure to be in high demand.

	Tape	5.25in	3.5in
RRP	£9.95	£11.95	£14.95
BAU Discount	£5	£6	£7.50
Offer Price	£4.95	£5.95	£7.45

Please note: *Speech!* is not compatible with the Electron

The program is not supplied in its original packaging but is complete and fully working.

THE TOTAL DTP SOLUTION

For a limited period we are offering *The Publisher* PLUS four extra discs giving a total of 86 different fonts for only £49.95!

The Publisher is a remarkably easy to use and powerful desktop publishing package, featuring its own page description language, allowing you to operate it from within *Wordwise*, *Wordwise Plus*, *View*, *Interword* or *Wordpower*, and giving you total control over the layout of your documents.

It features a unique preview mode so that what you see is exactly what you get, including different sizes of font, reversed text, grey backgrounds, centering, left and right justification, 8 box styles for highlighting text and creating borders, and much, much more.

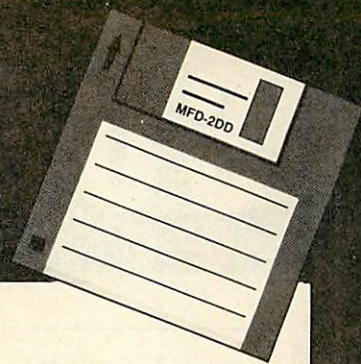
Combined with the 86 fonts, *The Publisher* offers you everything you need to produce professional-looking results — all in one package, and for less than £50!

But remember, this is a limited offer, so to be sure of your *Publisher* kit order your copy soon.

RRP	£105.80
BAU Discount	£55.85
Offer price	£49.95

Please order using the order form.

MASTER COMPACT



Brian Clough's Football Fortunes

Brian Clough's Football Fortunes is a football management game with a big difference. In an exciting departure from earlier simulation games it combines an excellent range of computer based features with a fascinating board game. Can you compete with human and computer managers to successfully steer your team through the season, using your skill to make it stronger as you proceed? With the program you get a large playing board, over 100 player cards, stacks of money, some counters and a comprehensive instruction manual. And for only £7.99 you're guaranteed hours of inexpensive yet intense, action-packed excitement!

RRP £9.99
BAU Discount £2.00
Offer Price £7.99



Colossus 4 Chess

Probably the most complete chess program available for any home computer and written using the very latest techniques, by a computer chess programmer with over eight years experience.

Colossus perfectly understands the rules of chess and can handle all standard mates, while offering you the choice between a two-dimensional flat board or a stunning 3D display.

It comes with a comprehensive instruction manual and must be the best chess program for casual and serious players alike.

RRP £14.99
BAU Discount £4.00
Offer Price £10.99



Colossus 4 Bridge

Colossus Bridge allows one player to play a complete game of bridge with the computer controlling the other three hands. Each hand is bid according to the Acol system, while other standard conventions are also available.

If you're a beginner at bridge you can make use of the in-built tutor which has 10 specially chosen hands to illustrate the principles of the game.

In fact, for just £10.99, whether you're a beginner or a more advanced player, you'll find Colossus Bridge is the ideal partner, either for practise or when you can't get another three people together for a game.

RRP £14.99
BAU Discount £4.00
Offer Price £10.99



Tank Attack

Tank Attack is a computerised board game for two, three or four players, where each player takes the role of a General commanding a country's Tank Corps of one or more armoured divisions.

Your objective is to capture the enemy headquarters, which will require the planned strategic deployment of your forces and regular fire duels between your own and enemy units. Weather, morale, skill, judgement, planning, foresight, careful management of rebuild and repair facilities and luck all play a part in deciding the result of each game.

RRP £14.99
BAU Discount £4.00
Offer Price £10.99



Birdie Barrage Golf

An excellent golf simulation offering you the chance to play at the famous Turnberry Ailsa, Belfry Brabazon, Carnoustie Championship and Acorn Park golf courses.

All the features you'd expect from a good golf game are here, including woods, water and bunkers.

And for just £7.99 this must be a game that should be in everyone's collection.

RRP £9.99
BAU Discount £2.00
Offer Price £7.99



Steve Davis Snooker

This has to be the best snooker simulation you can buy, which is surely proven by the fact that Steve Davis has endorsed it!

It includes a computer play option, infinitely variable speed, spin, friction factor, break score and a foul shot facility, as well as superb graphics.

If you fancy yourself as a good snooker player, for only £9.99 why not see just how good you are at the computer version.

RRP £12.99
BAU Discount £3.00
Offer Price £9.99



Sporting Triangles

No matter what your sporting preferences may be, Sporting Triangles is bound to intrigue, puzzle and frustrate you.

It includes over 2,500 questions to choose from, across 12 action-packed sports.

All the features of the top rating TV quiz show are combined in this superbly presented and equally compelling game.

RRP £14.99
BAU Discount £4.00
Offer Price £10.99



Football Director

Billed as the ultimate football challenge, Football Director features four leagues with 20 teams each, a 38 game season, home and away matches, FA and League Cups, replays and much, much more.

In fact it's so packed with features it really is almost like the real thing, including player's morale, substitutions, injuries, transfers, promotion and relegation, tax, interest, wages and many more than there are room to print here. At the virtually give-away price of just £9.99 Football Director will give you hours, if not days or weeks, of action-packed excitement.

RRP £12.99
BAU Discount £3.00
Offer Price £9.99



Blue Ribbon Disc 1

Five superb games on one disc:

- * Ravage
- * Nightmare Maze
- * Darts
- * Diamond Mine
- * Screwball

RRP £9.99 BAU
Discount £2.00
Offer Price £7.99



Blue Ribbon Disc 2

Another excellent compilation of five action-packed games:

- * Astro Plumber
- * Joey
- * Diamond Mine II
- * Castle Assault
- * Bar Billiards

RRP £9.99
BAU Discount £2.00
Offer Price £7.99



SUBSCRIPTIONS

SAVE £££s When you subscribe to **BBC ACORN** USER

OFFER EXTENDED UNTIL APRIL 30th 1990

You know that *BBC Acorn User* consistently brings you the best in news, reviews, hints and tips, hands-on tutorials, superb type-ins and much, much more.

So, why not save the hassle of queuing up at your newsagent each month and have your copy delivered directly to your door (before it's in the shops)?

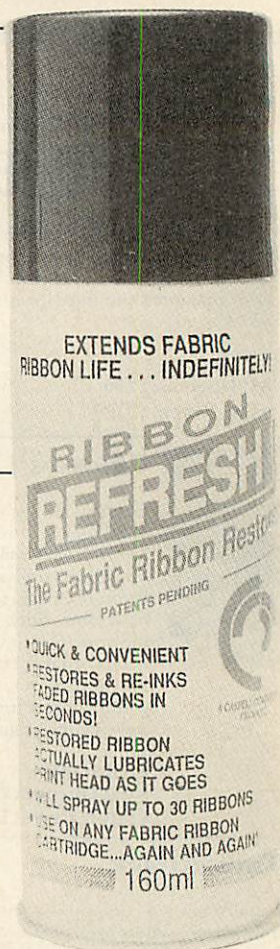
If you take out a subscription to *BBC Acorn User* soon, we'll send you a Caspell ribbon re-inker (worth £8.95) FREE, with our compliments.

But that's not all you'll save. With your free ribbon restorer you'll be able to re-ink between 20 and 100 ribbons. So, with an average cost of £3.50 per ribbon, you should save at least £70 and probably a lot more!

And it's so easy to use. Simply lift off the top of your ribbon cartridge with a screwdriver or knife, gently spray a little ink onto the ribbon, press the top back on and, you'll have clear, black print.

But please remember, this is a limited offer which is only available with UK subscriptions (either new or renewal) until Friday March 30th 1990. Make sure you don't miss out — place your order today!

ONLY £22.95



Get this ribbon re-inker
worth £8.95 FREE
when you subscribe

MISCELLANEOUS

**PLEASE SEE
THIS MONTH'S
YELLOW PAGES
FOR FULL DETAILS**

What's on this month's disc

You know that *BBC Acorn User's* yellow pages consistently bring you the best in new software for your BBC or Archimedes each month.

But why not save the wear and tear on your fingers, and get programs that work the first time by ordering this month's disc.

As usual it's packed with plenty of software for everyone.

5.25in disc £6.95

3.5in disc £7.95

POCKET POWER

Save over 20% on the unique folding Microdiary

Specially designed so that it fits easily in your pocket or wallet, but opens out to give two manageable sets of keys and a two-line display, the 20k Microdiary is the ideal way to keep your important information instantly to hand.

Forget about paper personal organisers, the Microdiary has no trouble holding even the busiest person's contact list, as well as appointments, reminders, memos and much, much more — and you don't need a pen, or have to buy refill packs of paper each year!

And the best news of all is that for a limited period we have reduced the price of this unique device by £10. For just £39.95 you'll have one of the easiest, cheapest and most secure means of managing your personal data.



- * Daily, weekly, monthly and yearly reminder
- * 21 definable function keys for quick access
- * Security code to prevent unwanted access
- * Paperless "printer" for reviewing entries
- * Address and telephone number storage
- * Accurate clock * Alarm function
- * 10 digit display calculator
- * 24 World time zones
- * Memo function
- * 20k memory

RRP £49.95 BAU Discount £10.00

Offer price £39.95



If you can't make up a bridge foursome, try the Dual Screen Bridge Computer

Only slightly larger than a paperback book, yet featuring 28 keys and two displays, the Dual Screen Bridge Computer is the ideal way for you to practice bridge.

Targeted at beginners to intermediate players it will help you improve your skills of bidding, playing and recall. While, if you are an advanced bridge player, the Bridge Computer will help you to keep your hand in. *And for just £49.95, saving £10 off the recommended price, you're sure to find it helps your bridge playing to improve — as well as being a fun pastime you can play anywhere.*

- * 4 levels of play
- * Plays 3 hands
- * Random cards generated for each hand
- * You bid against the computer
- * You can be dummy, declarer or defender
- * Checks for and disallows illegal play
- * Displays your cards, the dummy's hand, bidding, playing and vulnerability, and the results of contracts and tricks

RRP £59.95 BAU Discount £10.00

Offer Price £49.95



The go-anywhere Pocket Chess Plus Computer

This is a truly pocket sized chess computer featuring a touch sensitive board so you can forget about entering fiddly coordinates because the Pocket Plus knows where you move each piece.

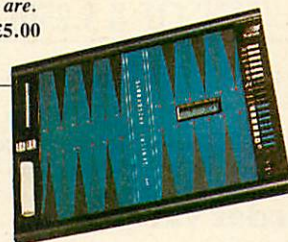
It comes with a comprehensive coaching facility which teaches tactical manoeuvres, warns you if a piece is in danger and even shows you its thinking.

Programmed with several difficulty levels, whether you are a beginner or a master, the Pocket Plus will give you a challenging game — every time. And it even remembers the state of play when you switch it off.

Normally the Pocket Plus sells for £34.95, but if you buy it from us we'll knock £5 off the recommended price. For just £29.95 you're guaranteed hours of enjoyment — where ever you are.

RRP £34.95 BAU Discount £5.00

Offer Price £29.95



Save £15 on the Saitek Sensory Backgammon Computer

This is a superbly presented portable or table-top backgammon computer which, like the chess computer, has a touch sensitive board so that it knows where you move the pieces.

It features 9 levels of play with a quick response program and a fully automatic random dice display. And if you don't want to play the computer you can use the board to play a friend too.

Recommended at £69.95, we have slashed £15 off the price of this superb product. Order yours today for only £54.95.

RRP £69.95 BAU Discount £15.00

Offer Price £54.95



ORDER FORM



OFFER OF THE MONTH

50 x 5.25in BAU blank discs	<input type="checkbox"/>	(11207-027)	£19.95
25 x 3.5in BAU blank discs	<input type="checkbox"/>	(11215-027)	£19.95

SUBSCRIPTIONS

With FREE ribbon Re-inker (UK only)

<input type="checkbox"/> (10006-027) NEW	<input type="checkbox"/> (10014-027)	Renewal
New subscriptions start with the next issue		
UK	<input type="checkbox"/> (10073-027)	£22.95
Europe	<input type="checkbox"/> (10049-027)	£35.00
Middle East	<input type="checkbox"/> (10057-027)	£40.00
Rest of the World	<input type="checkbox"/> (10065-027)	£45.00
Magazine Binder	<input type="checkbox"/> (12009-027)	£5.95

MONTHLY DISC SUBSCRIPTIONS

New extra-low prices — Save up to £8!

	5.25in		3.5in	
UK	<input type="checkbox"/> (18007-027)	£35	<input type="checkbox"/> (18015-027)	£40
Europe	<input type="checkbox"/> (18023-027)	£47	<input type="checkbox"/> (18031-027)	£55
Overseas	<input type="checkbox"/> (1804X-027)	£71	<input type="checkbox"/> (18058-027)	£76

MONTHLY DISCS

	5.25in disc		3.5in disc	
Jan 1989	<input type="checkbox"/> (13005-027)	£6.95	<input type="checkbox"/> (1351X-027)	£7.95
Feb 1989	<input type="checkbox"/> (13013-027)	£6.95	<input type="checkbox"/> (13528-027)	£7.95
Mar 1989	<input type="checkbox"/> (13021-027)	£6.95	<input type="checkbox"/> (13536-027)	£7.95
Apr 1989	<input type="checkbox"/> (1303X-027)	£6.95	<input type="checkbox"/> (13544-027)	£7.95
May 1989	<input type="checkbox"/> (13048-027)	£6.95	<input type="checkbox"/> (13552-027)	£7.95
Jun 1989	<input type="checkbox"/> (13056-027)	£6.95	<input type="checkbox"/> (13560-027)	£7.95
Jul 1989	<input type="checkbox"/> (13064-027)	£6.95	<input type="checkbox"/> (13579-027)	£7.95
Aug 1989	<input type="checkbox"/> (13072-027)	£6.95	<input type="checkbox"/> (13587-027)	£7.95
Sep 1989	<input type="checkbox"/> (13080-027)	£6.95	<input type="checkbox"/> (13595-027)	£7.95
Oct 1989	<input type="checkbox"/> (13099-027)	£6.95	<input type="checkbox"/> (13609-027)	£7.95
Nov 1989	<input type="checkbox"/> (13102-027)	£6.95	<input type="checkbox"/> (13617-027)	£7.95
Dec 1989	<input type="checkbox"/> (13110-027)	£6.95	<input type="checkbox"/> (13625-027)	£7.95
Jan 1990	<input type="checkbox"/> (13129-027)	£6.95	<input type="checkbox"/> (13633-027)	£7.95
Feb 1990	<input type="checkbox"/> (13137-027)	£6.95	<input type="checkbox"/> (13641-027)	£7.95
Mar 1990	<input type="checkbox"/> (13145-027)	£6.95	<input type="checkbox"/> (1365X-027)	£7.95
April 1990	<input type="checkbox"/> (13153-027)	£6.95	<input type="checkbox"/> (13668-027)	£7.95
May 1990	<input type="checkbox"/> (13161-027)	£6.95	<input type="checkbox"/> (13676-027)	£7.95
Jan-Dec 1989	<input type="checkbox"/> (1110X-027)	50.00	<input type="checkbox"/> (11118-027)	£62.00

SET OF 8 5.25in DISCS

☐ (11002-027) £24.95

Please tick ALL the relevant boxes and return this entire form, along with your payment, to the address below. If you are ordering over the phone it may help you to fill the form in anyway before you call us. Dial 0672 40825 to order by creditcard.

Total order value £

☐ I enclose a Cheque/Eurocheque/PO made out in pounds sterling, payable to Redwood Publishing Ltd.

I wish to pay by Access (Mastercard)/Visa (Barclaycard)

Card No.

Expiry date /

Signature _____ Date _____

Name _____

Address _____

County _____ Post Code _____ Tel _____

BAU Mail Order, Dept BAU 5, Marlborough Road,
Aldbourn, Wilts SN8 2HP

ELECTRON

NTQ two-rom pack	<input type="checkbox"/>	(15008-027)	£19.95
------------------	--------------------------	-------------	--------

MASTER COMPACT

Colossus 4 Chess	<input type="checkbox"/>	(15504-027)	£10.99
Colossus 4 Bridge	<input type="checkbox"/>	(15512-027)	£10.99
Sporting Triangles	<input type="checkbox"/>	(15520-027)	£10.99
Tank Attack	<input type="checkbox"/>	(15539-027)	£10.99
Football Director	<input type="checkbox"/>	(15547-027)	£9.99
Steve Davis Snooker	<input type="checkbox"/>	(15555-027)	£9.99
Birdie Barage Golf	<input type="checkbox"/>	(15563-027)	£7.99
Brian Clough's Football Fortunes	<input type="checkbox"/>	(15571-027)	£7.99
Blue Ribbon Disc 1	<input type="checkbox"/>	(1558X-027)	£7.99
Blue Ribbon Disc 2	<input type="checkbox"/>	(15598-027)	£7.99

GAMES

For each two Sams you buy tick another one FREE!
If you buy seven tick the other four FREE!

	Electron tape	BBC tape	BBC 5.25in disc	BBC 3.5in disc
Sam 1	<input type="checkbox"/> (16004-027) £9.95	<input type="checkbox"/> (16101-027) £9.95	<input type="checkbox"/> (16209-027) £11.95	<input type="checkbox"/> (16306-027) £14.95
Sam 2	<input type="checkbox"/> (16012-027) £9.95	<input type="checkbox"/> (1611X-027) £9.95	<input type="checkbox"/> (16217-027) £11.95	<input type="checkbox"/> (16314-027) £14.95
Sam 3	<input type="checkbox"/> (16028-027) £9.95	<input type="checkbox"/> (16128-027) £9.95	<input type="checkbox"/> (16225-027) £11.95	<input type="checkbox"/> (16322-027) £14.95
Sam 4	<input type="checkbox"/> (16039-027) £9.95	<input type="checkbox"/> (16136-027) £9.95	<input type="checkbox"/> (16233-027) £11.95	<input type="checkbox"/> (16330-027) £14.95
Sam 5	<input type="checkbox"/> (16047-027) £9.95	<input type="checkbox"/> (16144-027) £9.95	<input type="checkbox"/> (16241-027) £11.95	<input type="checkbox"/> (16349-027) £14.95
Sam 6	<input type="checkbox"/> (16055-027) £9.95	<input type="checkbox"/> (16152-027) £9.95	<input type="checkbox"/> (1625X-027) £11.95	<input type="checkbox"/> (16357-027) £14.95
Sam 7	<input type="checkbox"/> (16063-027) £9.95	<input type="checkbox"/> (16160-027) £9.95	<input type="checkbox"/> (16268-027) £11.95	<input type="checkbox"/> (16365-027) £14.95
Sam 8	<input type="checkbox"/> (16071-027) £9.95	<input type="checkbox"/> (16179-027) £9.95	<input type="checkbox"/> (16276-027) £11.95	<input type="checkbox"/> (16373-027) £14.95
Sam 9	<input type="checkbox"/> (1608X-027) £9.95	<input type="checkbox"/> (16187-027) £9.95	<input type="checkbox"/> (16284-027) £11.95	<input type="checkbox"/> (16381-027) £14.95
Sam10	<input type="checkbox"/> (16098-027) £9.95	<input type="checkbox"/> (16195-027) £9.95	<input type="checkbox"/> (16292-027) £11.95	<input type="checkbox"/> (1639X-027) £14.95
Sam11	<input type="checkbox"/> (16405-027) £9.95	<input type="checkbox"/> (16411-027) £9.95	<input type="checkbox"/> (1642X-027) £11.95	<input type="checkbox"/> (16438-027) £14.95

(All Sams must be on the same format)

Question of sport	<input type="checkbox"/> (16500-027)	£6.45	<input type="checkbox"/> (16519-027)	£7.45	<input type="checkbox"/> (16527-027)	£9.95
Trivial Pursuit	<input type="checkbox"/> (16608-027)	£14.95	<input type="checkbox"/> (16616-027)	£19.95		

UTILITIES

	Cassette	5.25in disc	3.5in disc
Speech!	<input type="checkbox"/> (17000-027)	£4.95	<input type="checkbox"/> (17019-027) £5.95
The Publisher	—	<input type="checkbox"/> (17116-027)	<input type="checkbox"/> (17124-027) £49.95

HARDWARE

Microdiary	<input type="checkbox"/>	(19003-027)	£39.95
Pocket Chess Plus	<input type="checkbox"/>	(19011-027)	£29.95
Dual Screen Bridge	<input type="checkbox"/>	(1902X-027)	£49.95
Sensory Backgammon	<input type="checkbox"/>	(19038-027)	£54.95
Tandy Flatbed Platter	<input type="checkbox"/>	(11215-027)	£299.00

Unless otherwise stated, please add £1 to each item for Europe and £3 per item overseas, excluding subscriptions. (All overseas orders are despatched by Airmail)

Please allow up to 28 days for delivery.

Don't forget. You can use our credit card hotline to order — 24 hours a day. Make sure you have your card ready and call: (0672) 40825

The program has been in the works for two years, on sale for six months, and has been acclaimed by the experts of two other Acorn magazines. So it might not seem like 'you read it here first'. But the real, 'finished' version of Computer Concepts' *Impression* DTP package was completed on 18 January this year – months after the so-called 'reviews'.

These reviews were based on incomplete prototype versions of the program and they both praised many 'features' which simply did not exist at that time!

Impression is written in Arm code, not Basic or C like most other applications. This makes it more difficult to write and debug, but has two benefits – it's faster, but more importantly the code is small (about half the size of Acorn *Desktop Publisher*). This means that unlike *ADP*, it can run comfortably and multi-task with small utilities on a 1Mb machine.

This fact alone could save you the need to add extra memory to your machine (though there's no denying it is useful).

Opening the stylish package reveals two novelties – a dongle, a book on the finer points of DTP – plus a well-written manual and the four floppy discs.

The dongle is a necessary evil: it's a tiny box that plugs into the printer port at the back of the Arc. You soon forget all about it – until you try to run *Impression* on another machine.

As an anti-piracy device, this is preferable to disc protection, as it neither stops you installing *Impression* on your hard disc (or indeed any other kind of disc), nor interferes with normal use of the machine (there's another socket on the dongle for the normal printer lead).

The book, *DTP at a Glance*, is as apt an introduction to the basics of typesetting and design for print as you could wish for. It's available separately, from Bookmark Publishing, and would be a worthwhile read for owners of *ADP* as well.

Impression's own manual is well above the average: I could spot only a couple of inconsistencies between the manual and the finished program, and the tutorial section is nicely paced. The unprotected discs hold

EASY TO IMPRESS

Whether it's adventurous desktop publishing or simple wordprocessing, **GRAHAM BELL** says the latest from Computer Concepts can do the job easily

Impression itself, a selection of scanned sprites and *!Draw* files, some example documents and tutorial material, and a copy of Acorn's outline font 'starter set'.

Included with this are the Trinity (Times), Homerton (Helvetica) and Corpus (Courier) typefaces which Acorn normally sells for £50, plus Computer Concepts' own Greek font that could be useful for technical work. The fonts will enhance other programs like *!Draw* that display or print using the fancy font system.

Installation

Impression is a 'frame-based desktop publishing' package. That means that you can create pages of a book, magazine, leaflet, or whatever. Anything that you want to put on a page has to go in a box, or frame. And frames can contain text, sprites (from a scanner, *!Paint* or a screen art package like *Artisan* or *Art Nouveau*) or drawings (from *!Draw*, *Presenter* or whatever).

For sprites and drawings, the size of the box controls the size of the illustration on the finished page; for text it controls the size of the column of type.

Impression starts up in the usual Risc OS way, installing its 'quill' icon. Clicking on it produces a window looking at a blank page. A five-item main menu gives access to the main features of the system.

The brevity of the menu belies *Impression*'s flexibility, as many of the menu options change according to what you are doing. So does the cursor – outside a frame it changes to a hand which can be used for scrolling around the page, whereas inside a

frame there's an I-shaped text editing cursor that automatically disappears as you begin to type. For adjusting frames, there's a snowflake-shaped cursor.

One problem is that the snowflake and I cursors are quite chunky, partially obscuring what you are trying to alter.

The screen can show the *Impression* page at any magnification from x10 to 1 percent size, and whatever the scale, text is shown smoothly and quickly. You can simply start typing, or load some text in by selecting the frame then dragging in a text file icon from disc or direct from *!Edit*. As the text is read in, it assumes a style called 'basestyle', the default typeface, size, line spacing and so on. And you don't need to flow the text onto each page manually as you do with *ADP*: it flows automatically onto succeeding pages, which is a great time-saver.

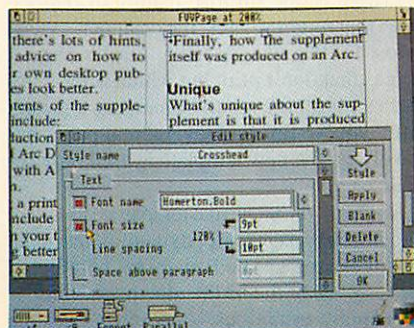
You can flow in many separate text files, and each 'story' flows separately through its own series of frames. Additionally, a document can be split into chapters, each having within it one or more stories.

Documents are stored on disc as whole application directories, not simple files. For long documents this is a boon, as the directory contains a file for each chapter. If you run short of memory then chapters you aren't working on can be saved to disc automatically, so in practice, there's no limit to the size of document you can create.

But renaming a document is complicated because if you change the name, the directory acquires the wrong icon, not the *Impression* file icon. And you must not rename a document you're working on.

Associated with each document is a master page – in fact there's one for each chapter. These control the layout of any new pages that are created, so you can put on the master anything that should appear on all the pages: frames for columns of text, graphic frames for logos and the like, even running headers and footers.

The master page can also include any number of guide frames – helpful for positioning things on the real pages. This is considerably more flexible than *ADP*'s system of column guides.



Styling

The styling system is one of the features of *Impression* that contrasts with *ADP*. The basestyle defines the features of all the text in a document, and any further styles you apply to a section of text merely modify this basestyle.

New styles can alter one or more attributes of the text – the typeface used or the size, perhaps – but any attributes that are not specifically set by the new style are ‘inherited’ from the underlying basestyle.

So the final look of a section of text can be controlled by numerous, layered styles. In the example below, the section of underlined text inherits its other features from the underlying italic and basestyles.

The range of attributes that can be set is somewhat wider than *ADP*. Font size can be set to 1/16th point, and leading to a thousandth of a point. You can set space above and below paragraphs, text colour, underlined, strikethrough, sub- or superscript, and the font aspect ratio (condensed or expanded). In addition, you can kern letter pairs very precisely, so *Impression*’s typographic control is quite professional – certainly better than that of *ADP*.

The only real deficiency is a lack of control over the degree of wordspacing and letterspacing used to justify the text. With some work in setting up the styles you want, this can be a very powerful system. There are even styles that allow you to compile an index or contents table automatically.

But there is a problem with this system: *Impression* doesn’t have quite the interactivity of the best DTP packages – there can be no ‘increase size by one point’ button. You can’t arbitrarily change something without setting up a style for it.

You can, however, add new styles at any time, through a complex dialogue box. Editing the styles and creating new ones is easy once you’ve understood the layering principle: you only need specify the attributes you want to change.

This and other dialogues used by *Impression* all have a ‘3D look’, not the usual spartan Risc OS standard.

There are a number of styles built-in by default – too many in my view. These are defined in a blank document which is loaded automatically when you start up *Impression*, so you can redefine them if you wish.

There are three other start-up files which provide a great way of creating quick documents on Epson LX, LQ and HP Deskjet or Laserjet printers. These provide a quick

‘character mode’ that uses the built-in characters of your printer rather than the much slower outline fonts.

You can still use simple styles like underline, bold and condensed to highlight your text, and the overall effect is similar to a wordprocessor like *View* or *Interword*.

Wordprocessing

One of the things that marks *Impression* out from *ADP* is its ability to act as a very good wordprocessor.

When typing text into a frame the display is commendably quick. Typing continues seamlessly across frame and page boundaries, and new pages are created as you need them.

The text reformats in the background, and there’s less of a wait while the rest of the page redraws than there is with *ADP*.

Impression has a host of key short-cuts, like CTRL-S for swap case or CTRL-A for delete, but these are not shown on the menus.

Search and replace are good and flexible, as you can include wildcards and even search for and replace styles or words which contain styles.

Impression can load files from *Interword*, *First Word Plus* and even Basic programs, or save text to !Edit when necessary. And it’s good to be able to transfer text between two *Impression* documents by cutting from one and pasting to another – you can work with both on screen, as *Impression* can keep track of up to 16 separate documents at once, or of more than one view of the same document.

One deficiency is that there’s no provision for counting the number of words in a section of text – information is available only for whole stories.

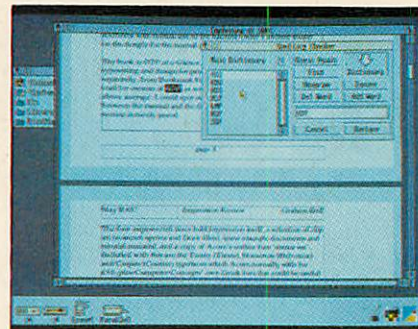
Given all of this, is *Impression* a DTP package or is it a wordprocessor? In most ways, it can be looked on as both.

The PC and Mac trend is for the chasm between wordprocessors and DTP to narrow, with wordprocessors acquiring multi-column abilities and better font control, and more convenient text editing being added to desktop publishers.

Impression follows this trend: although it is frame-based, and therefore DTP-like, it can be used as a minimum-fuss wordprocessor.

There is one surprise feature of *Impression* that might suggest the designer’s view. Most DTP packages have ‘master pages’, pages that don’t print but which act as templates for all the others. Changing a master after you’ve finished several real pages has no effect: the new template is used only for new pages.

Impression uses master pages too. But the master pages are dynamic: template changes are applied even to completed pages. From the DTP viewpoint, this is amazingly ambitious – no other package



even tries – and the difficulty of implementing this feature reliably must have contributed to the development delays.

However, a wordprocessor always allows you to alter things like the page length and margin size after you’ve written the text – and these are the wordprocessor’s equivalent of a master page. So dynamic master pages don’t look all that surprising from the WP point of view, and they are a unique blessing in *Impression*.

Printing and graphics

Impression’s print options are unrivalled. It uses the usual Risc OS printer drivers (the latest versions are included).

But the print dialogue is more flexible than the competition. For example, it allows you to choose a scale, so you can create tiny ‘thumbnail’ previews of your pages, and print several on one sheet of paper. And you can print without illustrations if you’re short of time.

Graphics are another of *Impression*’s strengths. Sprites or drawings can be loaded into a frame by dragging their file icon.

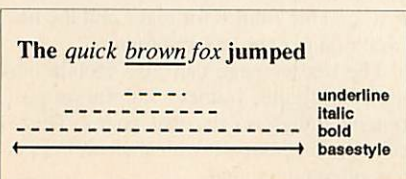
There are two important differences between *Impression* and *ADP* here. First, any imported graphics maintain their aspect ratio – circles in drawings stay round. Later, you can deliberately stretch, squash, trim, magnify or reduce illustrations.

The second difference is in speed – sprites in particular take a long time to appear in *ADP*, but *Impression* displays them on the screen almost instantly.

A unique method of ‘embedding’ frames can be used to make illustrations move with the text – a frame containing a graph, say, can be attached to a section of text, so if the text is reflowed onto another page, the picture moves too.

One of the utilities supplied with *Impression* is *FontDraw*. This allows you to type in a short piece of text, then it creates a !Draw file containing the shapes of the letters taken directly from the font definitions.

The drawing created can subsequently be manipulated in a wide variety of ways – expanded or condensed, rotated, coloured or turned into a hollow outline with !Draw – then imported into *Impression* (or into any other package) as a graphic.



Criticisms and conclusions

Sometimes, *Impression* doesn't do as you expect. It doesn't follow all Acorn's Risc OS guidelines: for example, as you edit a document, it does not show an asterisk in the window title bar as do *!Edit* or *!Draw*. Changing the default filename when saving does save a new copy of your document, but doesn't change the default name – so resaving using the default doesn't save to your new copy but to the original.

To select which style to edit, you use a menu within a writeable field within a dialogue box. And clicking on a window close icon doesn't remove the document from memory – there's a separate menu option for that. None of these are particularly important, but you do have to be wary of these oddities as you work.

Despite the thought that has gone into its design, there are still some strange shortcomings in *Impression*. It allows you to specify measurements (like frame sizes) in inches, millimetres, picas or points, but the picas and points used by most design and publishing professionals are unusable

because *Impression* shows 1.333 picas, not 1 pica and 4 points. This needs fixing. Master pages are identified by number, but names are more memorable – '3colA5' is better than 'number 19'.

The fact that you cannot easily tell the master pages apart demanded that I refer to the manual for the one I wanted. Also, picas cannot be shown on the style ruler, and tabs cannot be set precisely by typing in measurements.

Personally, I find it an irritating quirk that Delete Frame is in the Edit sub-menu, not under Frame. And deleting a chapter isn't on the menu structure at all – it's under Alter Chapter.

In all, working with *Impression* is a strange mix of the familiar and the downright quirky. But over a few weeks use, it has become my preferred wordprocessor. The draft character mode, automatic reformatting, and aids such as the spelling checker make it a great writing tool.

And you can set up start-up documents for standard forms like memos, letters and so on that you write every day.

Comparing *Impression* with *ADP* is clearly what most buyers will do, and it certainly scores well. It is convenient and a lot of thought has gone into the overall design of the package.

But the method of overlaying styles, and the dynamic master pages make it stand apart. The chapter structure makes for a powerful tool for long documents, but it has few parallels in other programs. And the latest version still has bugs to catch the unwary who don't save regularly.

However, *Impression* does answer many of the criticisms of *ADP*. It works on an unexpanded A310 or A3000. Importing graphics is sensible, text auto-flows properly, you can use 9 1/4 point text, condensed or expanded, even coloured.

The results in this month's DTP supplement speak for themselves – while it's not without its faults, *Impression* is a far better all-rounder than *ADP*.

Impression costs £171.35 from Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts HP2 6EX.

Outline Fonts

- From only £4.70 per font
- Suitable for all applications which use RISC OS outline fonts
- Ready for despatch to you now
- Properly 'hinted' so they will look good on ordinary printers, even at small sizes (beware of buying fonts which have not been hinted)
- This advertisement features EFF-AG and *Tamsin*

See the **BEST RANGE** at the **BEST PRICES** - ask for our **FREE 30-page Catalogue NOW**

PipeDrivers

From the publishers of *First Fonts* and *Power Fonts*, a new range of extensions to *PipeDream*.

PipeDriver Dot 1 (only £10) is a must for every dot-matrix user, giving full control of features such as print size and colour. Other *PipeDrivers* cater for **Mathematics, Foreign Languages or Download Typefaces**, and cost £19 (dot-matrix) or £29 (laser). Please specify subject and printer model.

We will be glad to supply your other needs, e.g.

Impression £135 Acorn DTP £125
PipeDream 3 + free PipeDriver £135

P&P on these items £3.50 each. Further reductions when bought with one of our Outline Font Discs.

Panasonic KX-P1124 printer £240 + £7 P&P

**Ian Copestake
Software**

Dept ACU2, 10 Frost drive, WIRRAL, Merseyside,
England, L61 4XL Tel: 051-648 6287
Prices exclude VAT Official orders and credit cards welcome

MicroEye 1A

Low cost, full colour video capture
for Acorn Archimedes computers

See us at
WHICH COMPUTER?
Stand 4357, Hall 4
Birmingham NEC
24 - 27 April 1990



...opens up a whole new field of exciting possibilities

MicroEye 1A - the full colour image capture card for Acorn Archimedes 400 and 3000 series computers - lets you explore the exciting world of Image Capture and Multimedia applications.

FEATURES

- ★ 640 x 256 pixel resolution per image
- ★ 24 bits per pixel (16.7 million) colour data
- ★ 256 grey scale (monochrome) mode
- ★ Fast image capture
- ★ Images transferred in Sprite form
- ★ Programmers' SWI library included

APPLICATIONS

- ★ Graphic design and Presentations
- ★ Picture-driven databases for Information Organisation, Access and Retrieval
- ★ Colour desktop publishing
- ★ Guides, reference and training material
- ★ Image processing, editing and analysis
- ★ Image storage, retrieval transmission

DIGITHURST

Specialists in Image Capture, Processing and Analysis since 1982, with over 3000 systems in proven use worldwide.

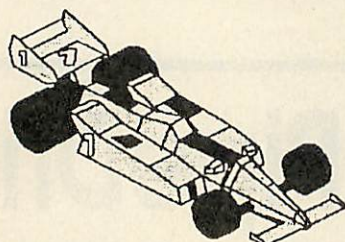
DIGITHURST LTD, Newark Close, Royston, Herts SG8 5HL

☎ Royston (0763) 242955, Fax (0763) 246313, Telex 818451 DHURST G

*The Image Analysis
People*

Ace Computing

RISC OS EUCLID



The only multi-tasking 3D graphics package for the Acorn Archimedes

Completely rewritten for Acorn's new operating system, RISC OS Euclid is a **fully interactive, multi-document 3D graphics and animation system**. Designed to be simple for the beginner to get to grips with, it has an **Intuitive, icon driven, single window interface**. Its features include:

- ◆ Object orientated data structure
- ◆ Curved surface primitives
- ◆ Cameras and lights
- ◆ Grid locking and measurement facilities
- ◆ Import and Export to Draw

"...ideal for use at home and in schools, colleges and industry...inexpensive, graphic, colourful and limited only by imagination" - A&B Computing, Oct '89

EUCLID - Explore a new dimension! Price: £70

Also available - RISC OS Mogul (animation add-on) £20

(all prices include VAT, P&P)

Send cheques to: Ace Computing,
27 Victoria Road, Cambridge
CB4 3BW. Tel: (0223) 322559.
Or from your local dealer.



MAKE YOUR ACORN/BBC EARN!

Yes making money with your Acorn/BBC becomes incidental when you know how. Your micro is, if only you knew it, a gold mine. The size and make is irrelevant. Make the initial effort **NOW** by starting your own **HOME BASED BUSINESS**.

This may be the most important move you will ever make!

REMEMBER: You'll never get rich by digging someone else's "ditch". Anyone in the country, including **YOU**, can become very rich in a relatively short period of time just by doing a few basic things! It's more rewarding than playing games. The benefits are many and varied. Full or part time. For **FREE** details send S.A.E. to:



HOME BASED BUSINESS

31 Pilton Place, Dept AU23
King and Queen Street
Walworth, London SE17 1DR

Best display in Scotland of BBC and Archimedes

FREE installation of all upgrades Scottish dealer for
WATFORD ELECTRONICS

Excellent prices on printers, monitors, drives etc . . .
REPAIRS to BBC machines

THE COMPUTER DEPOT

205 Buchanan Street,
GLASGOW G1 2JZ
Tel: 041-332 3944
CREDIT FACILITIES

55 Clerk Street,
EDINBURGH EH8 9JQ
Tel: 031-668 4146
★ ★ **NOW OPEN** ★ ★

SCREENED FOR VALUE

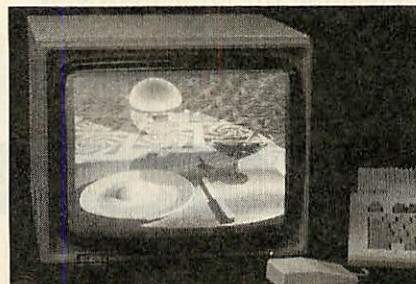
There was a time when no respectable BBC micro would be seen in public without the chaperone of a Microvitec Cub monitor. Inevitably, things changed and although remaining popular, Microvitec Cubs were soon joined by a host of alternative colour monitors.

When the Archimedes appeared on the scene, Microvitec was nowhere to be seen.

But now the A3000 is sweeping the board, Microvitec has given the new BBC micro a vote of confidence by launching the Cub3000 monitor especially for it.

The Cub3000 is, in truth, little different from the old Cub. This is a 'medium resolution' monitor – that is, it can handle 80-column text but it is not the sort of screen you'd want to stare at all day.

Unlike the old Beeb Cub this is an analogue RGB monitor so it can display all the colours produced by the A3000. There is also a 1W audio amplifier and loudspeaker in the case. This connects to the jack socket



on the A3000 but unfortunately only provides mono sound.

There are just three controls (apart from the power switch) for contrast, brightness and audio volume. Like the old Cub these are on the back of the case.

To get technical, the Cub3000 has a 14in screen with a 0.42mm dot pitch (the red, green and blue dots which make up the picture on the screen are 0.42mm apart) and an 8MHz video bandwidth.

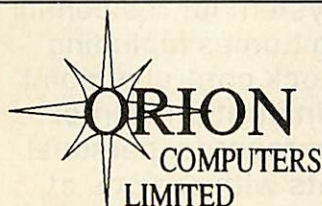
What all this means in effect is that the Cub3000 produces a reasonable picture for everyday use. The real question, of course,

Microvitec's Cub3000 monitor is aimed fair and square at the BBC A3000. **MALCOLM BROWN** has given it the once over

is how does it compare with its arch rival, Acorn's Philips model. Well the picture quality is about the same. The Philips monitor is better for detailed work – it seems to have a higher resolution – but the Cub3000 is brighter, more colourful and 'prettier'. It's swings and roundabouts. The Cub has no fold down stand and is much heavier but it is more robust and, of course, British.

You pay your money and takes your choice. Most important is that Microvitec is back in the Acorn market at all.

The Cub3000 costs £265 from Microvitec, Bolling Road, Bradford BD4 7TU.



Acorn
The choice of experience.

Authorised
Dealer



Dept BAU5
17 Carlton Road
Leyland, Preston
PR5 1LP
Tel: (0772) 421984
Fax: (0772) 622917

Callers by
appointment
only.

9am - 7pm
Mon-Sat

Archimedes

BBC A3000	£674.00
A410/1	£1189.00
A420/1	£1699.00
A440/1	£2469.00
Acorn Colour Monitor	£230.00
(If Bought with Computer)	£220.00
Philips CM8833	£235.00

Accessories

A400/1 1 Mb Ram Upgrade	£115.00
ARM3 Upgrade (A400/1)	£625.75
A3000 RAM Upgrade 1Mb	£172.50
(3 Mb Board with 1Mb Fitted)	
A3000 Ram Upgrade (1Mb board)	£140.00
Serial Upgrade A3000	£20.70
Acorn A3000 Monitor Stand	£31.05

All Pres Products Available

Printers

Star LC109	£161.00
Star LC10 Colour	£205.85
Star LC24-10	£246.10
Panasonic KX-P1124	£270.00

Other Printers Available

Modems

Dataphone Designer	£104.00
Data Pro - 4	£458.85
Pace Linnet 1200	£274.85

Bulk Diskettes



All our diskettes are Certified 100% Error Free. In the rare event that a disk fails it will be replaced immediately

			Quantity						
			25	50	100	250	500	1000	
5 1/4	DS/DD 96tpi	£7.50	£14.50	£27.00	£62.50	£120.00	£230.00		
3 1/2	DS/DD 880K	£16.25	£30.00	£55.00	£117.50	£210.00	£391.00		
	Sony Bulk	£21.25	£40.00	£75.00	£167.00	£315.00	£600.00		

Software (Archimedes)

C.C. Impression D.T.P.	£149.95
PC-Emulator	£108.95
(If Bought with Computer)	£69.00
Interdictor	£29.95
Atelier	£89.95
Multi-Store	£244.95
Fun School 2 (All ages)	£16.95
Hyper Pack (12 Games)	£79.95
Mini Packs (1-4)	£24.94

4th Dimension Games:

E-Type	£16.95
E-Type Extra 10 Miles	£14.95
The Olympics	£16.95
Arcade Soccer	£16.95
Holed Out	£16.95
Holed Out Vol. 1 & 2 (Each)	£14.95
U.I.M.	£24.95
Apocalypse NEW	£29.95

Printer Ribbons

Ribbons supplied are compatible unless otherwise stated

Citizen 120D	£3.40
Panasonic KXP 1080, 1081, 1090	£3.00
Panasonic KXP 1124	£5.00
Star LC10	£2.50
Star LC10 4 Colour	£5.75
Star LC24/10 or 15	£3.90

Many more Ribbons Available

All Prices Include V.A.T.

Minimum Order Value £7.50

Hardware Carriage Charges

2-3 Days	£4.00
Next Day	£10.00
Consumables & Software	
Free Carriage	
Allow 14 days for Delivery	

Please Note

This only a small selection of our products.
Orion Computers is a Licensed Credit Broker

**10% DISCOUNT
ON ALL SOFTWARE
PURCHASED OVER A TWELVE
MONTH
PERIOD WHEN YOU
BUY HARDWARE
FROM US**

A3000 STARTER KIT
A3000
MONITOR (COLOUR)
WITH A FREE PRINTER
WORTH OVER £200.00
£925.00 + VAT

A3000 UPGRADES

A3K1 Monitor Plinth	£24.95
A3K2 System Housing	£69.50
A3K3 External Podule Case	£14.95
A3K6 Disc Buffer Board	£48.95
A3K8 3.5" Additional Floppy Disc Upgrade	£75.00
A3K9 5.25" Additional Floppy Disc Upgrade	£99.95
A3K12 65 Host DFS and DFS Filer	£19.95
A3K7 Hard Disk Upgrade (inc controller card)	£429.50

ARCHIMEDES

Archimedes	Price
A3000	£649.00
410/1	£1199.00
420/1	£1699.00
440/1	£2499.00

DISC BOXES

Lockable	
40 Disc	£7.95
100 Disc	£9.95

ARCHIMEDES TELEPAD

Digitiser with mouse, emulation and stylus
pen by CTS £374.95

LASERS

MAKE	MODEL	PPM	PRICE
Panasonic	KX-P4450	11	£1436.00
Canon	MK IV	4	£1080.00
Epson	GQ5000	6	£1440.00
Qume	Publisher	6	£2376.00
Qume	Publisher II	6	£1228.00
QMS	Postscript	10	£3422.00
Brother	HL8	8	£1617.00

NOW OPEN!

CALDERGLEN'S NEW
6,000 sq ft Northern office
with approx 2,000 sq ft fully
equipped and totally dedi-
cated to demonstration and
training areas with extra
facilities for education and
business.
Special needs customers also
fully catered for

7 days a week

CALDERGLEN offer a unique service – on site teacher training for RISCOS, also a complete training workshop for indepth instruction on all hardware including ECONET. Courses for familiarisation of ART + DESIGN PACKAGES, DTP, SPREADSHEETS etc. Take the uncertainty out of buying hardware and software packages – try them first at CALDERGLEN – Free of charge.

PRINTERS

HYUNDAI

Model	Draft	NLQ	Price
80 Col HPP 910	216	37cps	£145
80 Col HPP 1810	240	100cps	£212
136 Col 920	216	37cps	£230
136 Col	210	100cps	£277

JUKI

Model	Draft	NLQ	Price
55 10 (P) 80 Col	180	30cps	£141
7100 24 Wire	288	96cps	£467
7200 CP 24 WAE	324	108cps	£1167

EPSON

Model	Draft	NLQ	Price
LX800	150	25cps	£244
FX850	200	40cps	£369
EX800	250	50cps	£506
132 FX1050	264	54cps	£482
136 EX 1000	250	50cps	£667
136 PFX 8000	833	80cps	£1367

1 Meg upgrades from £145
A full range of hard disks available from £199

PANASONIC 80 COLUMN

Model	Draft	NLQ	Price
KXP 1081	144	28	£130
KXP 1180	192	38	£178
136 COLUMN			
KXP 1592	216	45	£266
KXP 1595	288	61	£368

TEACHERS AND ACADEMICS NATIONWIDE

**Have you missed out
on the special
Acorn teachers
support facility?
If so, phone
CALDERGLEN
for their own specially
designed package**

MONITORS

Make	Model	Special price
Philips	8833 colour	£209
Philips	8832 colour	£189
Tandata		£165
Texan 770		£434
EIZO 8060H		£460

If you require any other manufacturers monitors
please ring for a quote

HEALTHCARE

A complete care management system for residential nursing homes including drug stock control at point of administration, cardex, patients records, personnel accounts with options of payroll, diary and staff duty rota and more covering the 1984 Good Homes Act!

AMIGA

A500 Computer, Mouse & Modulator
SPECIAL PRICE £365.00 inc VAT

A500 Batman Pack + 10 games and
Photon Paint valued at over £200
AMAZING PRICE ONLY £399.00 inc VAT

At CALDERGLEN we believe we offer a service second to none. Such as full familiarisation of programs, hands on evaluation of hardware, on site programmers to discuss your problems or our service engineer to discuss future upgrades to your equipment. Full training facilities are also available. Private customers and teachers across the country have found CALDERGLEN mean service.

Southern customers will soon be able to enjoy the high standard of service offered to our northern high street education and business customers. See the next edition for full details of our open days at our new southern demonstration + training offices.

MAIL ORDER

Payment by credit card, cheque or cash.

All prices subject to VAT (unless otherwise stated) plus P&P except disks.

CALDERGLEN
COMPUTERS
CARING IS OUR BUSINESS

279 KEIGHLEY ROAD
COLNE
LANCS
Telephone 0282 871717 (sales) (9 lines)
Fax: 0282 861726
0282 869338 (technical support)

Jigsaws have been a traditional source of entertainment for over a hundred years. Once micros came on the scene a number of programs arrived, enabling adults and children to do electronic jigsaws. Along with electronic sliding block puzzles, these found their way into schools to become popular educational software tools.

Now 4Mation has developed *Jigsaw* for the Archimedes and BBC A3000. It will be a welcome relief to schools deep into the National Curriculum!

Jigsaw is supplied on two discs, one containing the multi-tasking *Jigsaw* program with seven pictures and the other with eight pictures – all original artwork by Rodney Matthews and David Cowell.

The pictures themselves are remarkable works of art. They have been digitized from the artist's originals (with permission) and touched up with *Artisan* and *Atelier*.

Many of Colwell's pictures are just the sort real adult jigsawers love. Pictures of trees, rushing water and butterflies that are incredibly difficult to piece together as many pieces are so similar. Rodney Matthew's work is very sci-fi which will appeal to many older users but may scare the young.

In fact a number of teachers I spoke with did not want to use many of the supplied pictures in their classrooms. In one LEA the Craft, Design and Technology Inspector is supplying schools with a disc of simple screens created especially for five-seven year olds. It is a pity 4Mation does not provide simple pictures for infants.

However, don't let Matthew's bizarre screens put you off. Screens can easily be created with *!Draw*, *!Paint*, *Proartisan* or any package saving screens as sprites. Even the super screens from Resource's *Desk Top Stories* can be imported.

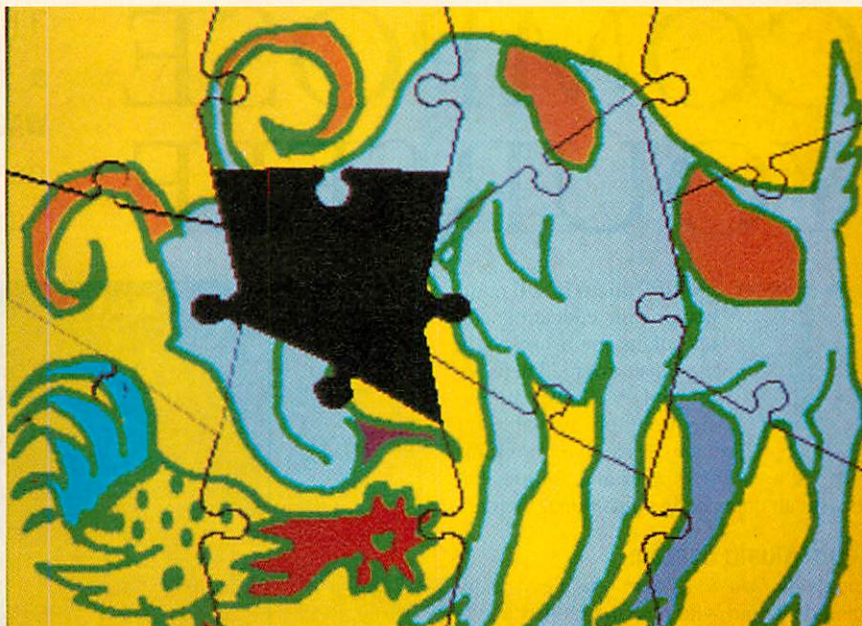
The program works with specially compressed screens which save a lot of disc space, but in true 4Mation style they include the compression routine so normal sprites can be compressed and used as *Jigsaw* files.

Load and go

Using *Jigsaw* is easy. The program uses Risc OS admirably. It installs on the icon bar and pictures are loaded by dragging their catalogue icons onto the *Jigsaw* icon.

A picture can be cut into pieces as you click. When the jigsaw is ready, the screen is divided into three windows. In the upper window are the jigsaw pieces and as the pointer is moved over the pieces an enlargement appears in the window at the bottom left of the screen. If the pointer is moved to this window a small version of the complete picture is shown; if this window is clicked a full sized picture appears. The bottom right-hand window shows the puzzle so far.

Assembling the pieces is very like pick-



PICKING UP THE PIECES

No more frantic searching under the sofa or chairs for that last vital piece for **DAVE FUTCHER** thanks to 4Mation's new jigsaw program for the Archimedes

ing up 'real' pieces. Clicking on a piece selects it and it can then be moved into position. The mouse will rotate pieces and if you find one has been incorrectly placed, it can easily be grabbed and re-positioned.

The picture can be 'cut' into 12, 20, 32, 48, 80 or 120 pieces. *Jigsaw* has 24 different levels of difficulty ranging from 12 to 120 pieces.

Jigging about

There are some rather tricky jigsaws supplied. What about working with picture-less jigsaws or upside down puzzles? You can even use *Jigsaw* to create 'real' card



jigsaws too. All you need to do is save a blank sprite and then use *Jigsaw* to create the outlines of the jigsaw pieces as a template to cut out a picture on card.

4Mation has always been an innovative software house. This is the first of a whole series of programs for the Archimedes and it bodes well for the machine's future as an educational tool.

Despite the screens provided, *Jigsaw* must be thought of as a 'content free' package used in any curriculum area to motivate and interest the children. I can see teachers collecting screens to fit in with themes and topics they are doing.

Jigsaw will develop visual discrimination, logic and problem solving. It will also help to encourage co-operation. 4Mation has come up with a new twist to traditional jigsaws, which I am sure will become very popular with the real educational users – children. This is a program for jigsaw crazed adults too, and you can't lose the pieces!

Jigsaw costs £29 from 4Mation Educational Resources, Linden Lea, Rock Park, Barnstaple, Devon. Tel: (0271) 45566.

COMPOSE YOURSELF

The BBC micro is still number one in education and one of its main uses is in the music room. There are probably well over 50 music programs available for the Beeb. Here we have five programs aimed at a variety of ages and abilities but all with an underlying educational theme.

Tobin Music System

The *Tobin Music System* was devised by Candida Tobin who also developed a system of teaching music through the use of colour. Many teachers will be familiar with her work.

The aim of the program is to assist the user to compose music – not an easy task even for a music teacher. However, it achieves this by not letting the user enter a note which will not harmonise with the accompaniment. Clever.

The main screen consists of two staves each of four bars, holding a preset chord progression. In the key of C the top staff will be C, G7, G7 and C and the lower staff will be C, F, G7 and C. You can select a 3/4 or 4/4 time signature and a C, F or G key signature although the harmonic progression remains the same whatever the key signature.

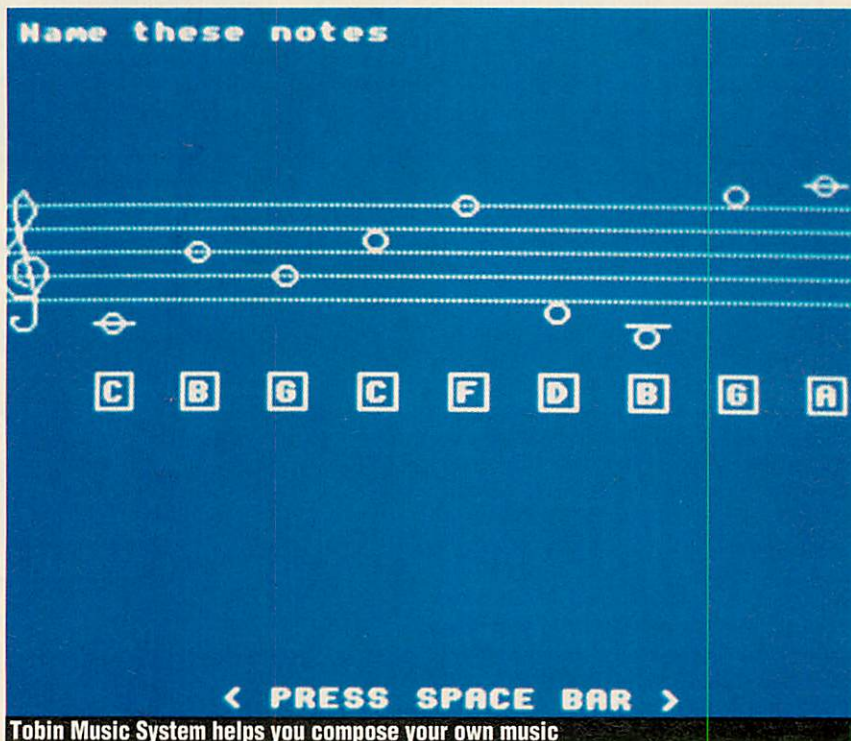
The first four bars play twice, followed by the second four bars followed by the first four again – a standard AABA or sonata form.

First you enter crotchets onto the staff using the cursor keys to move a bird around the screen. It holds a note in its beak (it is aimed at the younger element) and although you can move it to any line or space you can only enter a note if it corresponds to one of the notes making up the chord in that bar.

If this is already sounding complicated, fear not. A staff on the bottom left of the screen shows which notes are allowed (these change from bar to bar) and the program just won't accept a note if it's not right.

The next stage allows you to enter passing notes. These are quavers which are used to 'join up' crotchets.

There are limitations, of course. A passing note can only join two notes of the same pitch (by being placed between them, one note higher or lower) or two notes separated by a line or a space (in which case it is placed on the line or space). Again, the



Tobin Music System helps you compose your own music

program won't let you enter an 'incorrect' note. A simple vamp accompanies the tune during playback and you can choose from four different instrument sounds for the melody and accompaniment.

Initially, inexperienced users will probably find themselves producing tunes which sound the same but a little thought and some careful tuition can result in quite individual compositions, for example, by making sure there are no giant leaps between notes and by creating regularly rising and falling note patterns. Tunes can be saved to disc and printed out – a point of prime importance in the classroom.

As an introduction to composition the program is superb. Even if you don't know a C Major from a Sea Captain, you can still produce a piece of music which is all yours. It can then be refined according to taste, experience and available tuition.

Children, even those not musically gifted, feel a great sense of achievement upon completion of a tune.

I used the program with some 16-30 year old BTEC Music students and one was heard to remark 'That's the best tune I've ever written'. The program has much value and is highly recommended.

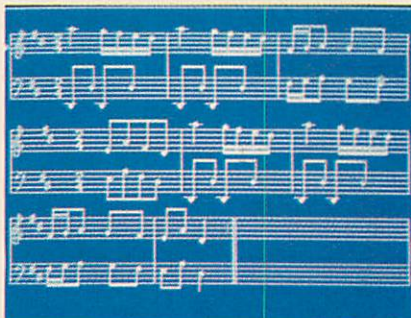
The BBC micro trains many a budding musician, so **IAN WAUGH** has been trying out five new software packages for a variety of ages and abilities

Music Processor

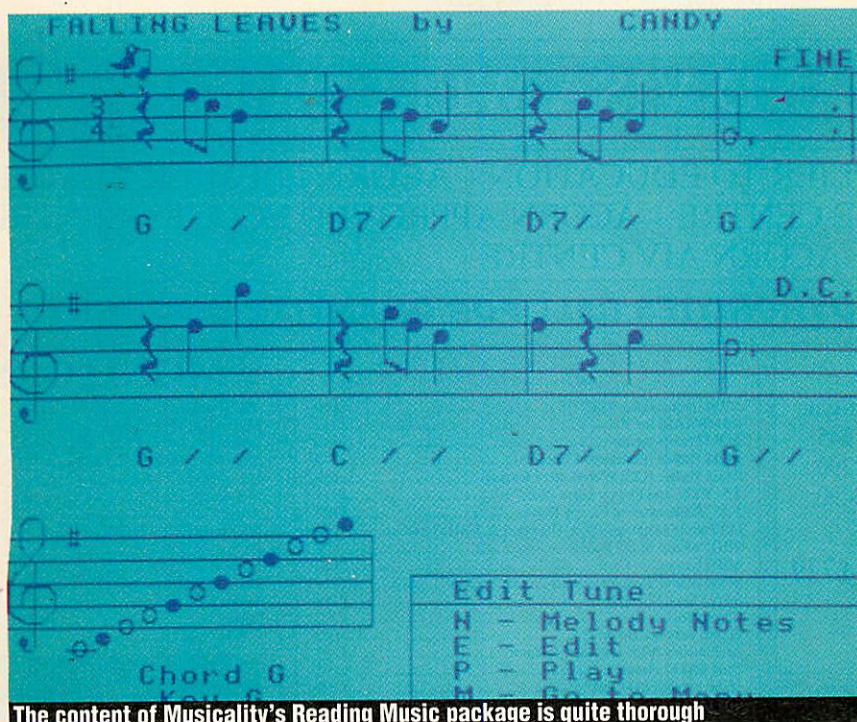
Mid-Sussex's *Music Processor* is a page based system which lets you enter music on up to eight staves per page.

The music can be saved, loaded, edited or transposed and individual parts can be extracted from a score. Editing takes place in a mode 4 screen which prints out as half an A4 sheet.

Notes are placed on the staff by pressing a key A to G. The pitch can be altered with the cursor keys and accidentals are entered by pressing R (raise) for a sharp, L (lower) for a flat and N for a natural. Double sharps and flats are available, too. Dura-



The processor gives excellent results



The content of Musicality's Reading Music package is quite thorough

tions are selected with the numeric keys 0 to 9 and stems can be flipped or removed. Chords are easy to enter. Additional dots for double dotted notes and repeat bar markers are entered by pressing H.

To beam notes, you first enter the notes as crotchets then step backwards beaming each note to the previous one. It may sound odd but it works quite well.

Each staff is independent of the others and you can't push music off one staff onto a lower one although copy functions let you copy from one staff to another.

There's a simple playback option (one part at a time only) which uses the Beeb's speaker but it may hiccup if it runs into too many semiquavers.

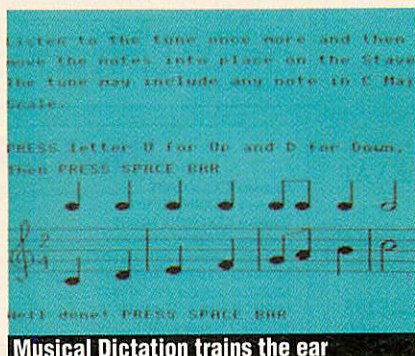
The program is written in Basic and driven from an amateurish mode 7 menu. There's not even a catalogue option.

Response is rather sluggish and there is an enormous amount of disc accessing. The disc is copy-protected but used to store temporary data – that makes me shudder! If you have a two-drive system you can specify the second drive for library files. If you don't, you'll be forever swapping discs.

In truth, the presentation of the program could be improved a great deal without too much trouble. As it stands, it just doesn't have a professional feel to it.

The program doesn't support text or music symbols but the package includes *Music Letraset* (produced by Mid-Sussex) which neatly solves the problem, if in a somewhat roundabout way.

Nevertheless, the results are excellent. It uses the printer's bit-image capability to produce the music rather than resorting to a screen dump although it takes a little time



for the computer to construct the image. It produces by far the best music output I have seen from a BBC micro.

Playbeeb

Playbeeb is for three-seven-year-olds and its main aim is to teach the concept of high and low, which it does using four programs.

The first draws a staff on screen, so large that it fills it. Pressing the middle row of keys on the computer keyboard plays a sound and draws a face on the staff. The letter pressed has no relation to the note. In the second program the computer plays a series of tunes and the notes are shown on the large staff as they play.

The third program is similar to the first except notes are indicated on a large piano-style keyboard with car and man figures. The fourth program plays tunes and shows the notes on the piano keyboard.

The programs are very simple. They may be worth considering if a child or student is having difficulty with the concept of high and low, but once this is grasped the programs will rapidly be out-grown.

Reading Music

Once you've fathomed Musicality's pricing structure, the rest seems quite easy! Actually, it is responsible for two mammoth packages. *Reading Music* contains 18 programs and *Musical Dictation* 24. However, the layout and the organisation could be considerably improved.

Reading Music, for example, is divided into *Parts*, *Programs*, *Sections* and *Chapters*, which does little except confuse.

Notes are positioned on the staff with the U (for up) and D (for down) – why not the cursor keys?

You can't escape from a program once you begin and you can't skip questions. You are only scored on the final two test papers which – unbelievably – ask the same questions every time.

The content, however, is quite thorough. *Reading Music* takes you from basics such as rhythm and pitch up to musical terms and signs, tonic triads and key signatures.

If you answer incorrectly you may be given a hint or referred to the relevant program and section number for revision which is a useful feature.

Musical Dictation

Musical Dictation is a set of aural training exercises – the music student's least-favourite topic. Again, some areas of implementation could be improved. For example, some questions ask you to enter a sequence of note durations but if you make a mistake you can't erase the last one. If the answer is wrong everything is cleared.

You generally hear a sequence twice – no third chance. If you can't get the answer, tough – the program won't tell you, you just have to keep plugging away until you get it right, or press **BREAK**.

But, like *Reading Music*, the content is thorough. You begin with simple high/low exercises followed by long and short note durations and build up to combinations of pitch and rhythm.

It's just a shame the developers didn't put more thought into the implementation because ease of use and user-friendliness go a long way in educational programs of this nature. But if you can live without these, the content is worthwhile.

Tobin Music System costs £11.95 from Helicon Press, Knight Street, Sawbridge, Hertfordshire CM21 9AX. Tel: (0279) 722318.

Music Processor costs £54.95, and Playbeeb £7.95 from Mid-Sussex Software, 11 Bridle Way, Pound Hill, Crawley RH10 4HP. Tel: (0293) 882130.

Reading Music 1 (four discs) costs £26, Musical Dictation 1 (three 80-track discs) costs £20 or (five 40-track) £26 from Musicality Software, 15 Cheddington Road, Edmonton N18 1LT. Tel: 01-803 9449.

Diamond Computer Systems Ltd.

Southampton (0703) 232777
London 01-597 8851
Midlands (0926) 312155
Bristol (0272) 693545
Eire 061 376744
Established over 20 years

Fax 232676
Fax 590 8959
Fax 883432
Fax 693223
Fax 376740

ACCESS AND VISA WELCOME

ACORN AUTHORISED SUPPLIER TO EDUCATION – ACORN PREMIER DEALER
ACORN APPROVED SERVICE CENTRE – ACORN APPROVED ECONET CENTRE
ACORN AIV CENTRE

EDUCATION & HEALTH AUTHORITIES CALL FOR QUANTITY DISCOUNTS

Archimedes Micro

System	Basic	Mono	Colour	Multisync
401	£1049	£1099	£1219	£1345
420/1	£1495	£1545	£1665	£1790
440/1	£2195	£2245	£2365	£2490

A3000 – £569 A3000 2meg £649

A3000 with Dedicated Colour Monitor – £729

Master 128K – £379

2nd Hand BBC's from £150

ACCESSORIES

NEW multitasking RISC OS	£29
0.5Mb RAM for 305	£110
ROM Module Acorn	£45
ROM Module (Computer Concepts)	£45
ROM Module (CC) With Battery Backup	£59
3.5" 800K 2nd Floppy Drive (305/310)	£118
5.25" 800K external Floppy Drive	£105
I/O Module (Analogue port, User port & 1MHz bus)	£80
MIDI add-on to I/O Module	£29
MIDI Expansion Card	£65
Mono Sound Sampler	£129
Stereo Sound Sampler	£166
Chromalock Module	£280
Econet network Board	£49
Archimedes IEEE Interface Adaptor	£269
Dual RS232 Module	£195
16 bit parallel I/O Card	£195
Archi MKII Replacement Mouse	£39
PC Emulator inc. MS DOS 3.21	£62
Software Developers Toolbox	£175
Floating point Unit	£549
SCSI Adaptor Expansion Card	£275
Archimedes RISC-OS Reference Manual	£79
Arm Assembly Language Prog. manual	£15
Archimedes BBC Basic Guide	£20

MONITORS

Vision Colour	£159
Microvitec 1431	£175
Microvitec 1431AP	£199
Microvitec 1451	£199
Microvitec 1451AP	£249
Microvitec 1441	£355
Acorn Philips	£199
Microvitec 2030CS	£379
Philips 8833 (U.K.)	£199
Microvitec 2040CS	£675
Taxan Supervision 625	£269
Taxan 770+	£419
Viking II	£849
CM 1686 16"	£1249

Special offer while stocks last

DIAMOND MULTISYNC II
Autoscan 14". Ideal for utilising the high
res modes on the Archimedes.
Our price includes tilt & swivel base
£299

Philips 8833
Colour Monitor
£199

Philips NMS 1432
Quality G-pin printer, 120cps
£125 inc VAT *While stocks last*

Switch Boxes2 way £12.95
4 way £14.95

10m Printer-Archimedes Lead
£29.95 inc VAT

Impressions (Computer Concepts) – £109
Pipedream – £109 A3000 joystick – £24.95 inc VAT
(Joystick fits into mouse port)

PRINTERS

CITIZEN Swift-24 Colour	£295
PHILIPS NMS 1432	£99
STAR LC-10 MARK II	£149
STAR LC-10	£119
STAR LC-10 COLOUR	£159
STAR LC24-10	£199
STAR XB24-10 COLOUR	£439
PANASONIC KX-P1124	£209
HP DESKJET	£499
HP PAINTJET	£649
CITIZEN 120D	£105
EPSON LX-400	£149
EPSON LX-850	£179
EPSON LQ-500	£249
EPSON LQ-850	£409
EPSON LQ-1050	£549
EPSON LQ-2550+	£895
EPSON SQ-2500	£909
OKIMATE 20	£159

LASERS

PHILIPS LASER with on-site maintenance	£899
CANON LASER MARK II	£1495
PANASONIC KX-P4450	£1395
HP LASERJET II	£899
NEC POSTSCRIPT	£2589

Call for details of our Software Club! For just £20 a
year you can get 30% off software prices, along with
special discounts on hardware!

DRIVES

Cumana CXS100 40T	£74
Cumana CSX400 40/80T	£89
Cumana CDX800/S 40/80T	£175
Cumana CD800/S 40/80T	£195
MD400A without PSU 40/80T	£78
MD400B with PSU 40/80T	£88
MD802C without PSU 40/80T	£156
MD802E with PSU 40/80T	£169
MD802D Plynth 40/80T	£190

RAM UPGRADES

A3000 1Mb	£99
A3000 4Mb	£449
A305/310 2Mb	£325
A305/310 4Mb	£549
A410/1 Upgrade to 2Mb	£149
A410/1 Upgrade to 4Mb	£399

NEW
PHILIPS XT 266, 386
with faster clock speed
and new software!
Call for details!

Full range of PCs available. Call for details

HOW TO ORDER

Call your local shop with your Access or Visa card or send a cheque made out to the
appropriate branch
Diamond Computer Systems Ltd, 114 Lodge Road, Southampton SO2 2QS
LAN Computers, 10-45 High Road, Chadwell Heath, Romford
LHC Microsales, 121 Regents Street, Leamington Spa, Warwickshire
Diamond Computer Systems Ltd, 227 Filton Avenue, Bristol
Diamond Computer Systems Ltd, Ballina, Killaloe, Co-Clare, S. Ireland

PRINTER RIBBONS

LX800 & FX800	£2.50
LC10	£4.00
Citizen 120D	£4.00
Taxan/Canon	£3.20
Juki 6100	£1.30
Panasonic KX-P450 Toner	£26.95

We are also Europe's
largest chain of **AMIGA**
specialists! Full range of
computers and accessories
available from all stores!

ALL PRICES EXCLUDE VAT. COURIER £5. NEXT DAY SERVICE £10

E&OE. All prices correct at time of going to press and are subject to change without notice

With so much publicity devoted to the Arc and Master, Beeb users would be forgiven if they felt left out. Of course, time moves on and so does technology but that's little comfort to you if all you have is a humble Beeb looking more dated as the days go by.

When the Integra-B board was first reviewed, in the July 1988 *Acorn User*, many companies were offering trade-in deals on model B's for Master 128's. A year and a half has passed since then and few companies are still making that offer.

What's more, the average trade-in price for a model B (issue seven board) is now only £125-150. So, although the Integra-B costs over £100, for Beeb owners it's still a cost effective alternative to purchasing a Master 128.

Since the original review, Computech has released a new version of the Ibos firmware which controls the board, and modified the board itself (now issue 3).

The Integra-B expansion includes 64K of sideways Ram (four banks of 16K), eight sideways Rom sockets, 20K of shadow Ram and 12K of private Ram used by the real-time clock and Integra configurations. A system disc containing application notes, a windowing system and software patches for popular packages is also included.

Documentation consists of a 65 page user guide and application notes. An optional 43 page technical reference manual is also available which acts as a supplement to the Advanced User Guide for the BBC micro.

Optional extras include extra Ram and a rather neat write protect switch assembly which fits on the rear of the Beeb's case. This is not a requirement for the standard 64K of sideways Ram as two jumpers may be removed instead. However, it is far more convenient.

Thanks to clear instructions, installing the Integra board is simple – just remove the 6502 processor and fit it on the Integra board. Power and control lines need to be fitted onto the main board but these are clearly labelled and no soldering is required.

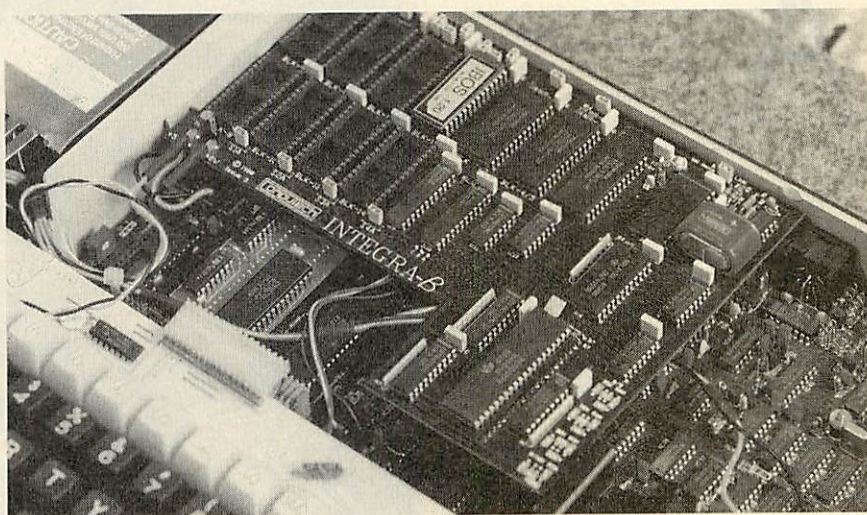
Alas, the disc controller board of most double density filing systems will be too high and gets in the way of the Integra board. Computech provides a service to reduce the height of DDFS boards, allowing them to be used with the Integra system.

This latest version of the board has been slightly modified to solve timing problems associated with some Pal-Prom devices which are used to support 32K and larger capacity Roms. I found using *Interword* and the *Solids RGL* Roms on the board now presents no problems at all.

The Ibos firmware provides many additional star commands as found in the Mas-

NEW LAMPS FOR OLD

The BBC model B can be upgraded to the specification of a Master with Computech's latest Integra-B board. **DAVID JANDA** equips his ageing Beeb



ter's OS. These include *APPEND and *SPOOLON. *TYPE to print a file to printer and, if the ADFS is fitted, *CREATE will create an empty file of a certain length.

Rom/Ram management is well catered for. A list of active Roms is displayed with *ROMS, and *UNPLUG and *INSERT saves wear and tear. Preparing a bank of Ram to accept a Rom image is done with *SRWIPE and *SRLOAD loads a file into the appropriate bank. The Master's *SRDATA is also included as is *SRREAD and *SRWRITE for reading to and from sideways Ram and the computer's main memory.

The Integra-B is fitted with battery backed Ram for storing up to 17 configurations. These include disc stepping rate, mode default and such like. In fact the Integra board negates the need for a Dip switch setting on the Beeb's keyboard as all the functions (and far more) are set with the *CONFIGURE option.

Besides using sideways Ram for Rom images or data it can also be used as a printer buffer with the *BUFFER command. 8K of private Ram is reserved as standard but up to 64K can be used. Here lies my only complaint regarding the Integra system. There is no indication of how much Ram may be reserved for a printer buffer when the *ROMS command is used. Instead

*BUFFER ? is used to list the size of buffer and which Ram banks are reserved for it.

Real-time clock commands include *TIME, *DATE, *CALENDAR and *ALARM. The date command is displayed in the form Thu,01 Feb 1990. Used together with numerous calculations such as *DATE + it would display Fri,02 Feb 1990. An alarm function with repeat is also provided.

Shadow Ram on the Integra board differs from the model B+, 128 and Master in that shadow Ram can only be used for programs and data, not for screen memory.

*SHX ON/OFF get around this problem by exchanging the contents of shadow memory with main memory.

The system gives the Beeb user many of the features found on the Master 128 and you'll appreciate the difference. The system enhances the Beeb greatly, and all the components work well together.

Of course, at £135 it is quite an expensive outlay for an old machine but your faithful Beeb is well worth it.

The Integra-B board costs £135, 32K Ram chip £16, write protect switch (2 out of 6 fitted) £7 and the extra switch unit £1.50 from Computech, 2 Belle Isle Terrace, Main Street, Grange over Sands, Cumbria LA11 6AE. Tel: (05395) 34604.

DRIVE ON

Adding an external disc drive to your Archimedes requires the fitting of one of the range of disc buffers that **SEAN SOLLE** has been busy surveying

Archimedes owners upgrading from Beebs soon encounter the problem of transferring data between their old and new machines. What with the Arc's early serial interface problems (thankfully now cured) and the 3.5in ADFS format, it's a real challenge to run ported applications under the 6502 emulator!

Connecting a BBC disc drive is also awkward, for unlike the Beeb, the Arc has no buffering between its floppy disc controller and disc drives. This prevents 5.25in and some makes of 3.5in drives from being used since they put too great a load on the controller chip.

Fortunately, the problem is easily solved by a small piece of interfacing circuitry to buffer the signals between drive and controller. A number of devices that do this are now available from a range of suppliers.

All these buffers were tested on a 310 and a 410, using a 3.5in drive supplied by Matmos and an old Akhter 5.25in drive.

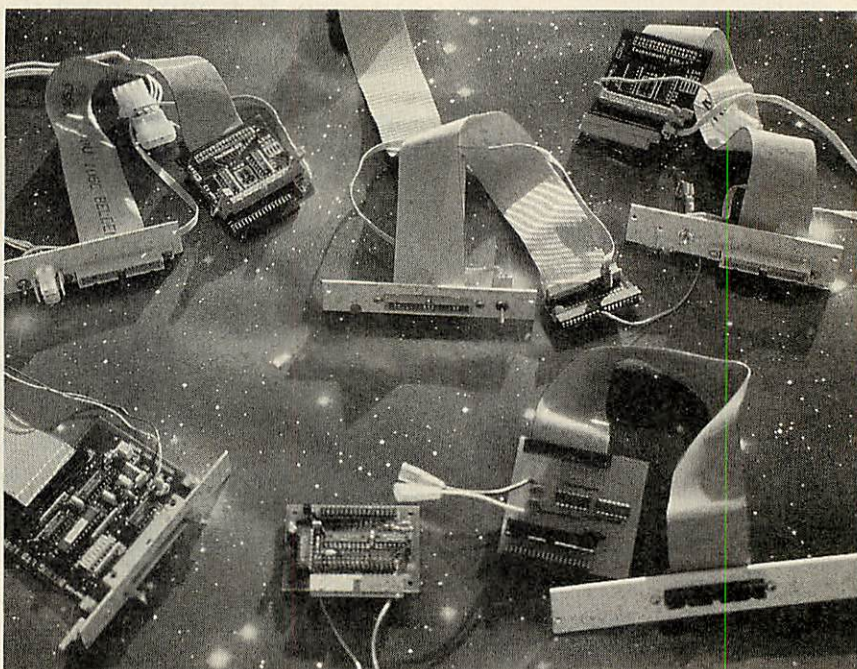
Curiously, the 410's disc drive cable must be fitted the opposite way up to the 310's. It would be advisable to specify which machine you need the interface for, as some cables have connectors with polarising notches. These can't be inserted upside-down, which means re-crimping the connector the other way up to fit it to a 410.

Installing any of the buffers is straightforward enough, as all the instructions provided are adequate. In most cases it is simply a matter of replacing the disc drive cable inside the Arc with the interface, and fitting a backplate containing the 34-way connector at the rear of the machine. No soldering is required on the interfaces.

Once fitted, standard BBC disc-drives may be connected, but they must have their own power supply. Powering an external 5.25in drive from an Arc could seriously hurt it. I was therefore surprised to find Technolog's buffer has an optional BBC-style power connector for an extra £3.

Table 1 compares the various merits of the interfaces, and the following text describes each of the features listed.

BBC drives are usually configured as



drives 0 and 1 so the buffers remap these to Archimedes drives 1 and 2 – without having to open up your disc drive to change links.

But when using the PC emulator, it's handy to have a 5.25in drive as drive 0, and rather than altering links on a pair of disc drives, some interfaces have jumpers to swap drive 0 with an external drive or a switch on the backplate.

Connections

The interfaces connect either by plugging the buffer board directly into the disc drive connector on the Arc's main PCB, or with a cable linking Arc to buffer.

The buffer boards need power from the Arc and they connect either piggy-back on to the hard disc 4-way power connector, or the main 0.25in spade connectors providing power to the Arc PCB or backplane.

The former method is probably preferable, as the spade connectors are quite a tight fit and the main Arc PCB can flex alarmingly when unplugging them.

Beebug

Unique to Beebug's MKII interface is 40/

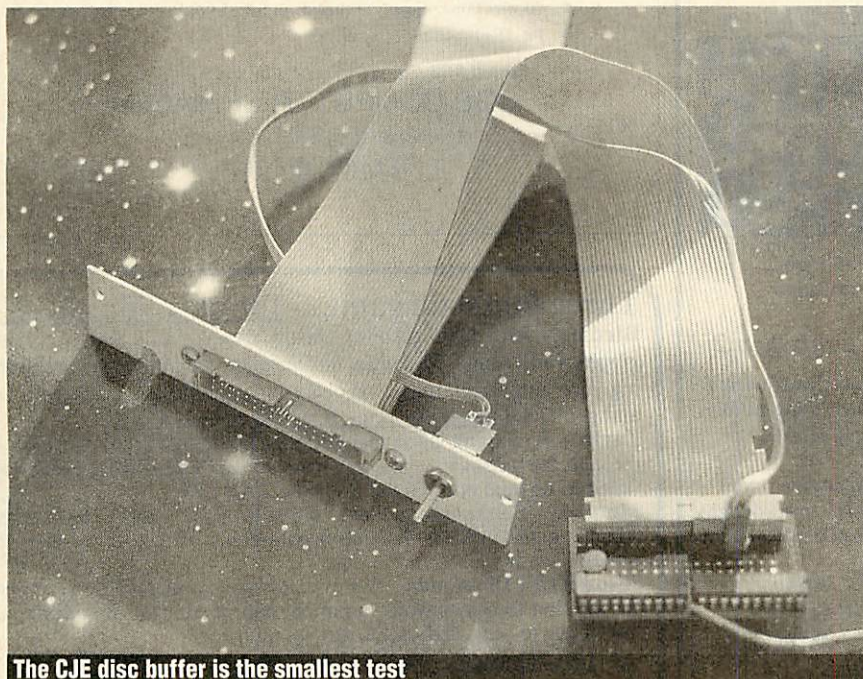
80 track switching. This allows external drive 0 to be double-stepped so that 40 track discs may be read in 80 track drives – a neat touch and very useful if your drive isn't switchable itself. This is also the only interface bolted to its backplate, making it the easiest to change links.

Beebug also supplies a DFS Disc Reader for £10.42, which can be used with any of the interfaces. It is supplied on disc as a relocatable module. Once loaded, this provides DCAT, DEX, DINFO, DCOPY and DBACKUP commands. As well as reading and copying standard Acorn DFS discs, this can cope with Watford DFS 62-file catalogue and double density discs, and is probably the best-value utility I've come across.

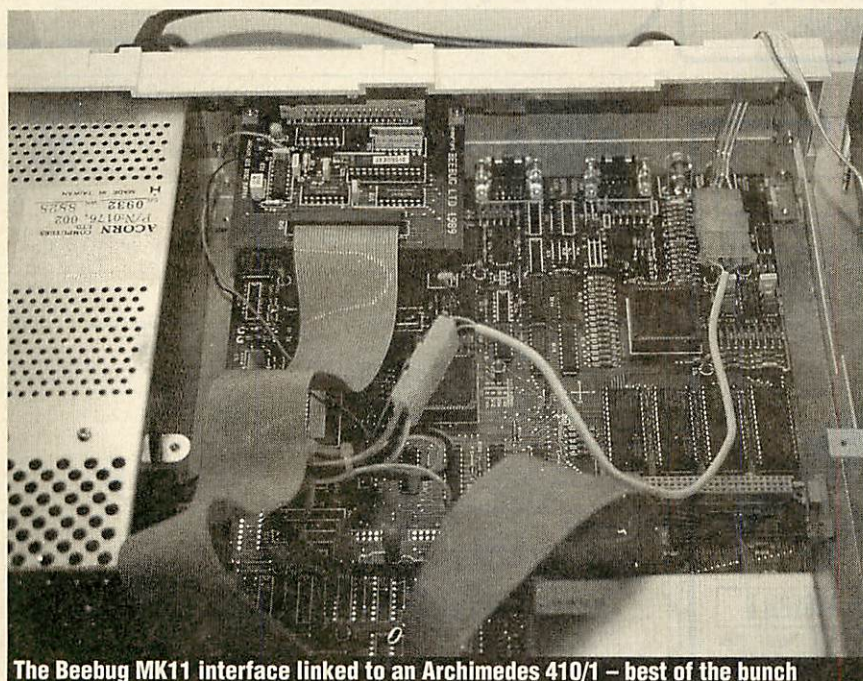
CJE

CJE Micro's board is the smallest on test, measuring only 30x55mm, and plugs horizontally into the Arc. An additional cable is required to re-map the external drive numbers.

However, the instructions do explain how to reconfigure the drives themselves. Unless you share the external drive with a



The CJE disc buffer is the smallest test



The Beebug MK11 interface linked to an Archimedes 410/1 – best of the bunch

BBC, the cable isn't really necessary. Drive 0 swapping is possible by changing links, or with an optional switch on the backplate.

For £20, CJE also supplies a DFS utility disc which reads, writes and formats DFS discs. However, occasional problems occur when writing to DFS format discs, and on examining the Basic listing, it appears the program is not correctly updating the catalogue sectors.

HCCS

The HCCS board is the simplest of the batch, consisting only of a pair of IC's and the necessary disc and power cables. Unlike the other interfaces, the backplate is full-width and being of extremely heavy gauge steel, it doesn't flex annoyingly when connecting the disc drive.

Technolog and Technomatic

Technolog's and Technomatic's interfaces are virtually identical and are in fact both made by the former. Like the HCCS board, the PCB plugs vertically into the drive connector on the main board.

The interface is normally configured for one internal drive and three external. To change this to two internal drives requires soldering, which Technolog will do for a nominal charge.

This is annoying, as the cost of fitting movable links would be very small and would simplify matters enormously.

However, Technolog wins brownie points by being first on the scene with a recently announced version for the A3000, which plugs horizontally onto the CPU board.

Watford Electronics

Watford's MKII board fits neatly above the Arc's internal disc drive on self adhesive pillars, connecting to the main PCB with a cable and thus putting no stress on the connector.

This is definitely the best value for money board on offer. It is a no-frills design but probably the choice most tight-budgetted educational users will choose, ignoring the backplane and switch that bump the price up by £19.

Conclusion

If you sold your trusty Beeb to buy the Archimedes, if you want to use 360K PC format discs, or if your hard disc means you just can't cram another drive inside the case, an external interface is an essential piece of kit!

The Beebug board is the best of the bunch but it is the most expensive too. If funds won't stretch that far, all the others provide the goods and good value.

Thanks to Khalid Owen of Microfix, Canterbury for the use of the Archimedes 310 for this review.

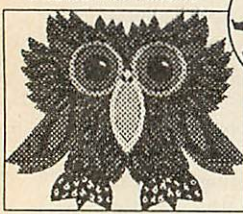
	Beebug	CJE	HCCS	Technolog	Technomatic	Watford
Price	£34.50	£30	£27.60	£34.44	£34.50	£24.15
Backplate	0	0	0	0	0	£19
Remaps drive no.	0	.	0	0	0	0
Drive 0 swap	switch	link	.	switch	switch	link
Drive Connector	cable	PCB	PCB	PCB	PCB	cable
Power Connector	cable	.	spade	cable	cable	spade
40/80	0

Table 1. A summary of how the disc buffers compare

CraftShop 1

☆ FREE ☆
DEMO DISC
Send a SAE
and blank disc

created with Patterns



Price includes site licence
Network version available

CraftShop 1


Patterns: allows the creation of complex designs using patterns produced by combining simple shapes.

Stitching: allows 2D and 3D curve stitching designs to be created and rotated to give the appearance of mobiles.

CraftShop 2

Suitable for
both the Junior
and Secondary
age range

created with Embroider




Use CraftShop on
all your machines

CraftShop 2

Embroider: allows "embroidered" designs to be created using patterns formed by combining stitches.

Tiling: in combination with Acorn's Paint allows small designs to be created and repeated across the screen.



each
package
£29.00
+VAT

☆☆☆ **For the Archimedes** ☆☆☆

4MATION Educational Resources
Linden Lea, Rock Park, Barnstaple, Devon. EX32 9AQ
☎ 0271 45566 TTNS 01:YNK045

ARCHIMEDES EXPANSION BOX

Fit more expansion cards to your system

- ◆ For the ACORN A300, A400 and A3000 series
- ◆ Increase to 6 slots for A300/A400 and 4 slots for A3000
- ◆ 3 external single and full width expansion cards can be fitted
- ◆ Plugs to A series backplanes or A3000 expansion connector
- ◆ 40 watt Power Supply included; +12 & -5 volts
- ◆ Fit Hard disc & floppy drives

Contact SGB Computer Services for prices and delivery
SGB COMPUTER SERVICES

140 Disraeli Road, London SW15 2DX
TEL: (01) 874 5675

Three fantastic games - for only 75p each!!

Birdies - An exciting shoot-em-up arcade game with excellent graphics and sound. Shoot the birdies to the ground by skillfully aiming your gun barrel, but you'd better be good: these birdies learn fast and get fast! **This game alone is worth at least £5.00!**

Zarlix - A cunning game that will give hours of fun. Bluff your way through the passages - you will have accomplished what many have failed to do, and dodged the invisible ZARLIX!

Manzala - Be the first to clear your side of the board in this ancient African game that has puzzled tribal people for centuries! Can you fathom it out?

Also **FREE**; **Diamonds** - A clever game of strategy for two players. Be the first to outwit your opponent and obtain four diamonds in a line! Easy to play, difficult to stop playing!

Yes, **just 75p each** - dial 0898 654497 to order today!

Copyright Inspiring Software. Calls charged at 25p/min cheap rate, 38p/min peak rate

Quality Products for the BBC Micro

PRINTER SWITCH-BOXES

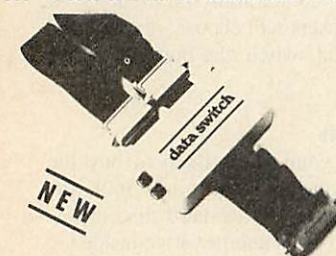
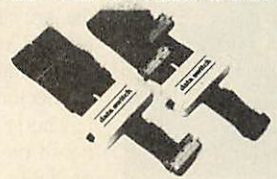


These useful switch boxes are ideal for use in the office or at school. No need to keep swapping cables over just press the button! The cables supplied are 2 x 1.7m + 0.4m with appropriate connectors fitted. Both version may be used with a plotter if required. Super value.

These high quality 3 and 4 way printer switch boxes are ideal for use in schools and colleges. The switch is extremely cost-effective. It will allow up to four micro's to share just one printer by simply pressing a button. Both versions come complete with all cables. The PS4 box has 2 x 3.7m + 2 x 1.7m + 0.4m to the printer, the PS3 has same but only 1 x 3.7m. Data buffers are fitted to the extra long 3.7m cables to give reliable data transfer.

PS3 3 BBCs to 1 Printer £59.50
PS4 4 BBCs to 1 Printer £69.50

PS1 2 BBCs to 1 Printer ... £31.50
PS2 1 BBC to 2 Printers ... £31.50



32K RAM MODULE

Store all your ROMs on disc then load them into the RAM module as and when required. Plugs into just one sideways ROM slot giving two separate 16K banks. Complete with write switch software on 40 or 80 track disc plus full documentation.

RM2 32K RAM module £25.95

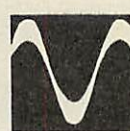
This quality switch box is designed for the Archimedes / A3000 range of computers and IBM PC compatibles. The ribbon cables supplied are 2 x 1.5m + 0.4m to the printer. The unit can also be used with a parallel plotter.

PS5 2 Archimedes to 1 Printer £34.50

Terrell Electronics

7-B ESSEX GARDENS HORNCURCH ESSEX RM11 3EH

PLEASE ADD 15% VAT **TEL: 040 24 71426** POST & PACKING FREE
EDUCATIONAL AND GOVERNMENT ORDERS WELCOME • QUANTITY DISCOUNTS



dataplex

129 Bath Road, Slough, Berkshire SL1 3UW

Tel: 0753 35557

Fax: 0753 511122

ARCHIMEDES - INCLUDING NEW RISC-OS				Amstrad LQ5000	295.00	NEW MANNESMANN TALLY INKJET	
	Basic	Mono	Colour	Brother HR20 Daisywheel	380.00	(Black)	
A310	839.00	879.00	1078.00	Brother HR40 Daisywheel	688.00	THE MT30 at only 375.00	
A310M	939.00	999.00	1138.00	Canon PT 1060 Inkjet Col.	420.00	Longlife 24 Nozzle Print Head, Tractor,	
10.5Mb Ram for 305			139.00			Paper Roll + Cut Sheet, Paper Handling	
"Rom Module			48.00	Dot Matrix Range	115.00	Optional Sheetfeeder 99.00	
"Rom Module + Bat. Backup			59.00	Citizen 1200	127.00	RIBBONS	
"2nd Drive for 305/310			118.00	Citizen 180E	255.00	KXP1081/1090/1120 4.00	
"Backplane for 4 Modules			39.00	Colour Upgrade for Swift	42.00	DMP 2000/3000/3160 2.80	
"Backplane for 2 Modules			29.00	Epson LX400	219.00	DMP 4000 4.40	
"IO Module			85.00	Epson LX850	289.00	PCW 8256/LQ 3500 4.50	
"20Mb Disk & Controller			469.00	Epson FX1060	405.00	Panasonic 3131/MP26 4.40	
"PC Emulation Pack			79.00	Epson LQ400	195.00	LX800 FX/MX/FX80 3.15	
New Archimedes 3000 Systems			589.00	Epson LQ500	249.00	FX1000 FX/RX100 4.40	
BBC MASTER 128 PACKAGE				Epson LQ550	255.00	NL10 4.40	
Save over £30.00				Epson LQ850	395.00	LQ500 800/850 4.40	
BBC Master 128				Epson LQ860	518.00	LC10 4.40	
+ 5.25" 400K Drive 40/80T + Philips				Epson LQ1060	649.00	NEC 5.00	
CM8833 Colour 14" Med. Res	677.00			HEWLETT PACKARD			
DISK DRIVES FOR BBC				Thinfjet	265.00	Various selection in stock. Please call for	
Drives without PSU				Quietjet	334.00	LASER PRINTERS	
5.25" Single 400K Drive	89.00			Quietjet +	399.00	Brother HLBE 1369.00	
5.25" Dual 800K Drive	169.00			Deskjet	438.00	Brother HL80S Postscript 2940.00	
3.5" Single 400K Drive	89.00			Deskjet +	524.00	Epson GQ-5000 1125.00	
Supplied in dual height casing for future				Paintjet	646.00	Hewlett Pack Laser II 1248.00	
upgrade				Rugged Writer	864.00	Hewlett Pack Laser IID 1939.75	
3.5" Dual 800K Drive	139.00			All Hewlett Packard Printers come with 12		Panasonic KXP 4450 1319.40	
Combo Drive	204.00			months on site warranty. Fully Epson/IBM		Qume Crystal Print WP 995.00	
Drives including PSU				compatible		Qume Crystal Ten Postscript 2969.00	
5.25" Single 400K	104.00			Star LC10 Mono	135.00	Star LP8 1249.00	
5.25" Dual 800K	189.00			Star LC10 Colour	175.00	All laser printers include 1 year on site	
5.25" Dual in horizontal plinth,				Star LC15 9 pin, 136 col.	264.00	maintenance	
switchable	225.00			Star LC24-15 24 pin, 136 col.	328.00	FAX	
3.5" Single 400K Drive	109.00			Star LC24-10	225.00	Amstrad FX9600T 535.00	
3.5" Dual 800K Drive	177.00			Star XB24-10	389.00	Canonfax	
Combo Drive	224.00			Star XB24-15	524.00	Fax80 623.00	
All 5.25" are 40/80 Switchable				Star FR10	299.00	Fax230 915.00	
MONITORS				Star FR15	389.00	Fax410 1415.00	
NEC Multisync 3D	480.00			NEC P2 Plus	523.00	Nelax N2 (Special Price) 849.00	
NEC Multisync IIA	349.00			NEC P6 + 80 Character	389.00	Nelax N3 1006.00	
NEC Multisync Plus	612.00			NEC P7 + 136 Character	523.00	Panifax UF150 915.00	
NEC Multisync 20" XL	1359.00			Colour Upgrade Kit	80.00	Panifax UF250 1265.00	
M1402 14" Msync 3D	299.00			Panasonic KXP1081	128.00	Sanyofax 100 989.00	
Philips BM7502 12" Mono	79.00			Panasonic KXP1124	229.00	Sharp FO80 849.00	
Philips BM7502 12" Amber	89.00			Sheetfeeder	89.00	Sharp FO-150 959.00	
Philips 8833 14" CGA	219.00			Panasonic KXP1180	144.00	Sharp FO-210 1269.00	
Philips 8852 14" Hi-Res	269.00			NEW MANNESMANN TALLY			
Philips 8873 M-Sync 14"	418.00			LAUNCH OFFER			
PRINTERS				MT81 (Dot Matrix)	115.00	REPAIRS - Most Repair work undertaken	
Amstrad DMP3250	115.00			Sheetfeeder	62.00	Please telephone us for competitive	
Amstrad LQ3500 DI	189.00			Serial IF	32.00	quotes	
Amstrad DMP400	175.00						

Conditions of Sale

All prices exclude VAT and delivery charges • E&OE all prices subject to change without notice • All collections made by prior arrangement from our warehouse • Please add £1 + VAT for consumables and £8 + VAT for all other items for next day delivery

The advent of Risc OS in early 1989 brought early obsolescence to the first real Arc wordprocessor, *First Word Plus*. While the Arthur-based original could be used under Risc OS, it required some modification and still took no advantage of multi-tasking, easy data exchange or the familiar user interface. Version two brings *First Word Plus* right up to date.

The two unprotected discs and manual are packaged in a substantial and attractive box, together with a registration card and keystrip.

The application boots up and installs the most boring icon yet seen on the icon bar. It grabs around 400K of memory, so there's plenty of room – even in a 1Mb machine.

The main display shows a grey ruler across the top of the window, which controls the current line length and tab settings. Below this is the text, drawn in a dark grey. Black is reserved for bold, and a pale grey for 'light' text. Italics and underline are also shown clearly.

The plain 8x8-pixel system font is used rather than the anti-aliased graphic fonts, which makes for a clear and legible screen and fast scrolling. But the readability of the text would be improved if a little space were introduced between lines.

You can load and save *First Word Plus* own files and save plain text files too (to use with *Edit* and so on) but there's no provision for loading direct from *Edit* (the manual gives a series of search and replace operations to prepare *Edit* text beforehand) nor for loading any 'foreign' wordprocessor formats. If you've just upgraded from a Beeb or a Master then Software Solutions' *View-IWP* and *Wordwise-IWP* conversion utilities are a must.

The text editing, page layout features and most of the other commands are fairly familiar stuff and it all works smoothly after very little practice. It's a very effective writing tool, and new in this version is a useful swap case.

Most commands can be accessed by CTRL-key shortcuts or function keys. The short-cuts appear on the menus too, so you gradually learn most of them even without the manual.

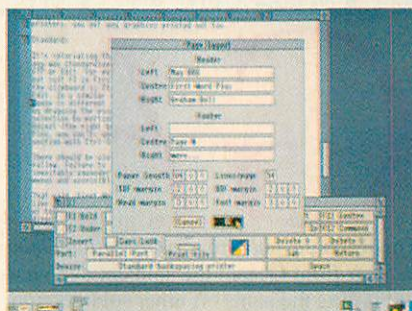
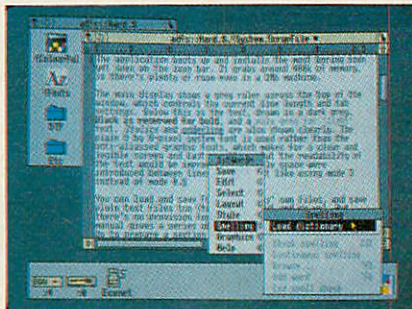
There's a spelling checker with a respectably-sized dictionary and sensible automatic hyphenation if you want it. You can add footnotes to the text and incorporate sprite files (not *Draw* files) into the document.

With several separate windows, you can work on up to four separate documents at once and cut and paste text between them but as with the original *First Word Plus*, there's no way of having two views of the same document.

There were two fundamental design prob-

FIRST UP

The first real wordprocessor for the Archimedes has been updated as the first of a series of Acorn productivity tools. **GRAHAM BELL** scribbles a few words



lems in the original *First Word Plus*, and both of these remain.

The first affects hanging indents – you can't have them (reformatting the text destroys them). The second arises from the fact that tabbing, centring and the like insert fixed spaces into the text, not real tabs. So if you change the ruler width, 'centred' text doesn't move.

Printing your document is simple, though it's not integrated into the Risc OS print architecture (so make sure the Risc OS driver isn't printing anything else when you decide to print a *First Word Plus* file). *First Word Plus* comes with its own set of printer drivers covering most dot-matrix and daisywheel models (but no Integrex colour, laserjet or Postscript).

You can customise your own drivers but this does seem like an insane step backwards. Printing is always done from disc, so you can work on another document while it's printing.

It is quick, and uses the printer's own characters so you get good value out of any NLQ options you paid for.

There's a utility, *!1stChars*, which allows you to type in any special characters

your printer supports that aren't on the keyboard, and on dot-matrix printers, you get any graphics printed out too.

Standards

It's infuriating that things like key shortcuts aren't in any way standardised. They aren't even the same as Acorn *!DTP* or *!Edit*. For example, to get italic is CTRL-I in *!DTP*, but just I in *First Word Plus*.

Cutting from the text to the clipboard is CTRL-F7, CTRL-D in *!DTP* and CTRL-X in *!Edit*. The use of the mouse to select areas is different too.

There are clear guidelines for software authors to follow. Failure to standardise features like this will inevitably squander much of the ease-of-use gained through menus and accessible multi-tasking.

That said, *First Word Plus* does feel for the most part like 'real Risc OS'. It's simple to write text, check style and spelling, then transfer it direct into Acorn's *Desktop Publisher* by dragging the file icon.

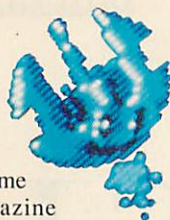
Text styles like bold and italic survive and if you have the necessary 2Mb of memory to run *!DTP* and *First Word Plus* together, it's a neat system.

Without Acorn *!DTP*, though, it's fairly limited. Apart from footnoting and incorporating graphics, there's little you can do that cannot be managed on a Beeb using *View* or *Wordwise* (with help from *Spell-Master*). It may be considerably easier to accomplish on the Arc, but there's no giant leap forward in capability.

If that's the sort of simple system you're looking for and you plan to stick with a dot-matrix or daisy printer then *First Word Plus* will suit you well. I liked it, just as I did the original Arc version.

However, things have moved on in the last two years. If multiple columns, smart graphic fonts in different sizes or illustrations from *!Draw* feature in your plans, and particularly if you aspire to a laser printer, then *First Word Plus* is certainly not the best choice. *Impression*, and even *Pipedream* are better tailored to your needs.

First Word Plus version 2 costs £92 from Acorn dealers. Upgrades from version 1 cost £45.



Every time a magazine mentions its user base, the Electron seems to be a great source of amusement in the Acorn games world. Well I have a message for all Electron users out there. The hardware company, Pres has released a multitude of games compendiums on 3.5in and 5.25in discs.

Virtually all the golden oldies have been nabbed, including *Magic Mushrooms*, *Arcadians*, *Frak*, *Planetoid*, *Zalaga* and even *Miller Gorilla* (surely some mistake there...). The discs cost £11, give or take a few pennies for different formats, with eight games each. Pres can be contacted on (0276) 72046.

Repton Infinity fans still struggling despite the publication of the passwords program last month may like to know of the various built-in cheats, courtesy of Barnes Cook from California. Presented with the five option menu, and having selected 'play game' hold down the keys spelling CHEAT while the game loads. It is tricky on the Master version as it loads virtually instantaneously – but it is possible!

This allows you to move on the map, by holding down CTRL-M while playing (again rather tricky).

For Master owners only there is a hidden message (long!) which can be accessed, again, from the five option menu. Start at

'play game' and press B. Then move down to 'editors' and press A. Move down and press N. Down again to press J and finally O.

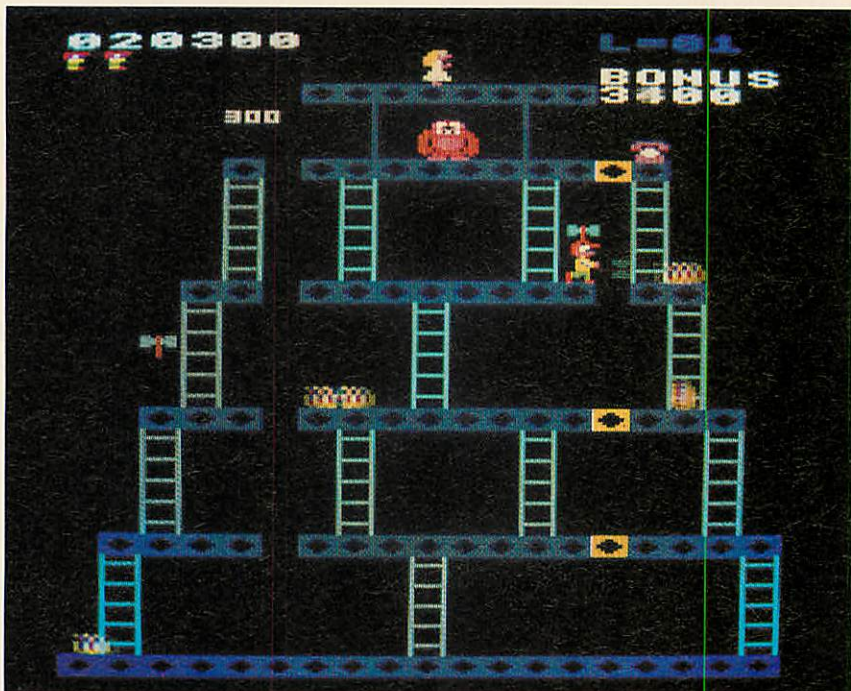
The best things for Archimedes owners coming up are the so called 'pilot games' from the big companies.

They are timidly dropped into the market to test the water for future games – so buy them! The most eagerly awaited at present is *Hard Drivin'* from Domark, due a couple of weeks before Easter.

Virgin Mastertronic's Leisure Genius label has *Monopoly* in the pipeline. Unfortunately the pipe may not end until the summer and even then it could stop with a closed end. Apparently though, the 8-bit versions are still selling fairly well, hence the company has high hopes for the Arc.

US Gold is producing a game called *E-Motion* for the Arc. Whether or not we will see it, is dictated by the market of the day. An interesting point is that the code, graphics and sound were mostly written and designed on the Arc in the first place. They were then converted into Amiga and ST format for sale in the shops.

The author used the Arc as a development machine because it was the best for the job but the game itself is essentially for those with only half a mind to buy them – the 16-bit crowd (half a mind, Gettit?)



Killer Gorilla – one of the games soon available on disc for the Electron

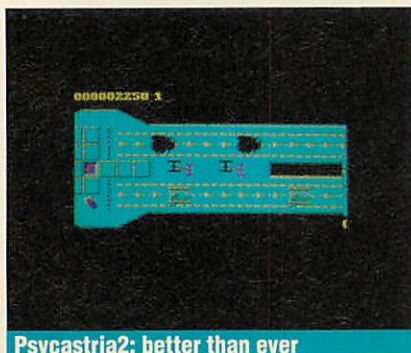
GAME

Finally on the pilot front is *Operation Thunderbolt* from Ocean, the soldiers-eye view of blasting the pants off other soldiers from an armoured haven. Start looking out for it in May.

The Fourth Dimension's Archimedes *Liberator* game name is no longer the same. Now called *Apocalypse*, the 'super 3D graphics plotting routine' that it is based on has unfortunately fallen through the floor and out the window. However, alternative algorithms have been found.

In the Beeb dimension is a game called *Inertia*, which is apparently a cross between *Marble Madness*, *Orbital* and *Imogen*, and *Nevryon*, which is a sideways scrolling shoot-em-up with 'jazzy graphics'.

Sam Greenhill



Psycastria2: better than ever

Fab Four

Audiogenic Tel: 01-861 1166

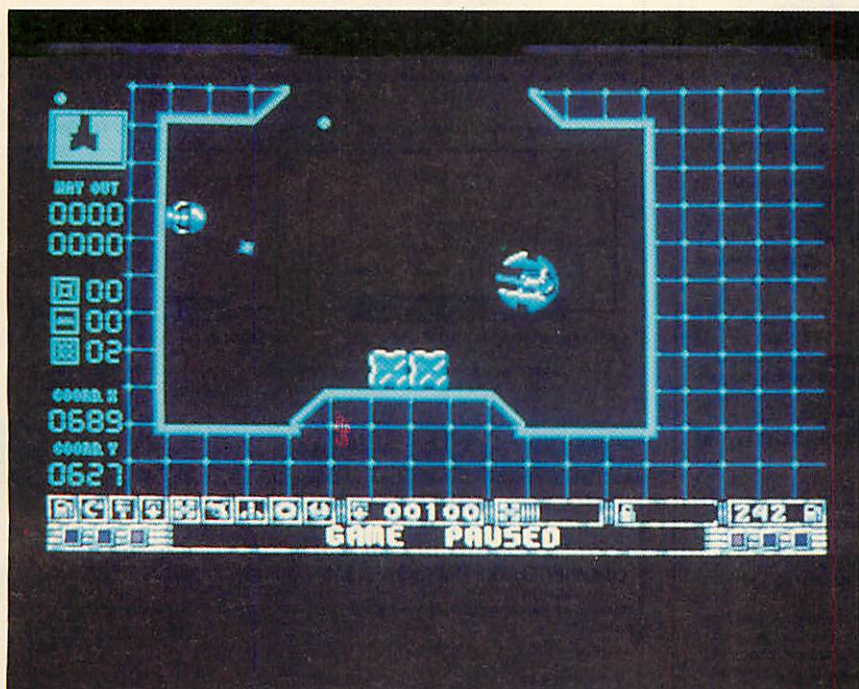
BBC cassette £9.95, disc £12.95, Electron cassette £9.95

Publishers sometimes yield to the temptation of watering down compilations with an offering that's below par. Not so this pack, which features four games from two of the most talented individuals in Gamesland, Gary Partis and Peter Scott, two programmers with contrasting styles but comparable skill.

Even if you already have all these games, there's something for you here, as Gary Partis' offerings, *Psycastria 2* and *Sphere of Destiny 2* are, to coin a phrase, 'remixed' versions of the classic originals, now even more playable than before, and with screens not seen before in *Psycastria 2*.

The Partis forte is creating games which call for lightning fast reactions, whether you're controlling a peaceful bouncing spherical object or shooting 'em up from a novel perspective. There's little subtlety here but plenty of action.

Flip the disc and you're in a different world. Peter Scott's *Arcade Adventureland*, with all his usual trademarks – amusing animated action hopping about all over the place, realistic fiendish puzzles and novel



Rotor could be described as the best ever shoot-em-up for the Arc

SHOW



Deadly creatures from Omega Orb

touches such as a computer you can interrogate with its own language.

The animation is so realistic and the characters so lovable, you're soon involved enough to care deeply about their fate, whether you're playing the stranded weaponless spaceman in *Thunderstruck 2* or the cute but deadly bouncing creature in *Omega Orb*.

Both games work on the principle of contact with nasties decreasing energy levels rather than spelling loss of life, which means that you don't have to be absolutely perfect while you're learning.

One of the best compilations yet for the Beeb. Very highly recommended.

Bernard Emblem

Rotor

Arcana Tel:(0272) 297162

Archimedes £24.99

Hands up all those who pine for that all-time-favourite, *Thrust*, to play on their Arcs. The wait is over and it's been well worth it.

Rotor takes all the best bits from *Thrust*, to make what can only be described as the best yet shoot em-up on the Archimedes. The aim is to pilot your 'rotor' around a series of caves and tunnels, collecting enough sun-crystals to escape from an enemy fortress.

The task is not an easy one, especially when you have enemy cannons firing up your after-burner. Just when you think you're stable, a localised gravity field is on hand to suck you in or throw you against the nearest wall. Flying the rotor is difficult, so a training mode is provided. Provision is made for mouse control although the keyboard feels easier and more responsive.

As well as the sun crystals, there are a number of extras that can be collected to upgrade your ship. When you first start a mission, the rotor is a slow and cumbersome craft. But once you've got all the add-ons, you can go off around the tunnels, blasting everything in sight with little chance of the slightest scrape. The graphics and sound in *Rotor* are a direct port from



the 16-bit version of the game.

But that isn't to say that they're bad, quite the opposite really. The ship has a metallic look and the backdrops are excellently drawn with realistic drips of water.

Sound comes in the form of a realistic collection of arcade-like bangs and crashes. Connecting the Archimedes up to an amplifier gives a real sense of 'being there'.

Arcana should be congratulated on its commitment to the Arc and I look forward to future releases with anticipation.

Rob Miller

Perplexity

Superior Tel:(0652) 58585

BBC cassette £9.95, disc £11.95, Compact £14.95, Electron cassette £9.95.

Perplexity is one of those games which you'll either like or hate. As soon as the game loads a repetitive tune starts playing. This soon starts to grate but luckily you can turn it down or switch it off (thank god!). The sound effects are much better and add to the atmosphere of the game.

The game looks very similar to *Pacmania* but has a puzzle element in between the action. The character (who is also similar to pac-man) has to complete 16 levels of brain damaging puzzles.

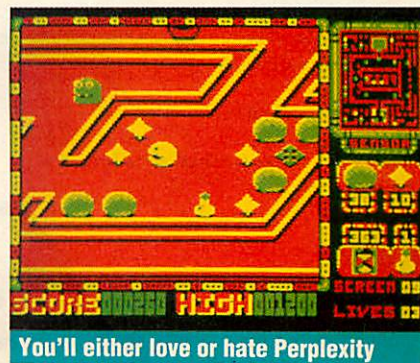
To complete a level, the character has to collect all the diamonds in the maze in the face of lethal monsters and boulders which block your way and cannot be destroyed.

To complete a section of the maze a key is needed but it's up to you to find what key goes where.

The graphics are not bad but the colour in the background is irritating. The scrolling is good with fast updates making it smooth but the 3D effects could have been more solid. It looks like the main sprites are floating in the maze.

Overall, this is a good game mixing arcade action and puzzles well. A classic for your collection, but you might end up smashing your Beeb in frustration if the puzzles are too much or you push the key in the wrong gap!

Enver Mehmet



You'll either love or hate Perplexity

BBC and IBM file interchange by MicroBoss Ltd

Software for the IBM PC-XT-AT or compatible:

BeebDOS£46.00 inc p&p & VAT

BeebDOS is a powerful set of utilities which run on the IBM computer and enable it to read and write many BBC diskette formats providing almost a complete BBC filing system on the IBM. BBC double density diskette formats supported are Acorn ADFS, Watford, Solidisk, OPUS DDOS and UDM. Acorn/Watford single density DFS are only supported with an IBM AT (or AT compatible) with 360k drive. Please send for our information sheet. Some of the utilities included are:

BCOPY Copy files BBC - IBM, IBM - BBC, BBC - BBC (wild cards & path names allowed).

BCONV Flexible IBM file translate facility enabling text to be passed between VIEW, WORDSTAR, IBM DISPLAYWRITE, MICROSOFT WORD and any programs which can import or export text files.

BGRAPH Display BBC mode 0,1,2,4,5 screen format (AMX Art included) files on IBM CGA, EGA, VGA and Hercules screens for use in IBM PC presentation, DTP, drawing and other graphic applications.

BeebDOS Test Pack£5.75 inc p&p & VAT

This pack provides an economical method of testing whether BeebDOS will work with your IBM/compatible computer and BBC diskette format. The pack contains three of the BeebDOS utilities backing up, cataloguing and formatting BBC diskettes.

BBC BASIC to IBM BASIC translator ..£46.00 inc p&p & VAT

If you have copied your BBC BASIC programs to IBM diskette using BeebDOS this translator will assist in converting them to run under IBM BASICA, Microsoft QuickBASIC and GWBASIC. This software is of special interest to program authors who wish to convert their BBC BASIC programs to run on the IBM PC. Please send for an information sheet.

Special Offer: BeebDOS + BBC BASIC to IBM BASIC translator£80.50 inc p&p & VAT

BBC - IBM file transfer service

We can transfer files, BBC to IBM and IBM to BBC for you. Simply send us the disk(s) containing your files. Indicate the format of the original and copy diskette and include payment per diskette involved in the transfer. Prices as follows (inc p&p and VAT): DFS 40 track=£5.00, DFS 80 track=£6.00, ADFS 40 track=£7.00, ADFS 80 track=£8.00, ADFS 160 track=£9.00, IBM 360k=£6.00, IBM 720k=£7.00, IBM 1.2mb=£8.00 and IBM 1.44mb=£9.00.

The cost of the copy diskette is included in these prices. So for example to copy files from one BBC DFS 40 track to one IBM 360k diskette will cost £11.00 (£5.00+£6.00) inc p&p and VAT and we return the original together with the copy. We cannot accept responsibility for any loss of data so please ensure you have taken a backup copy of any diskettes you send to us.

PAYMENT BY CHEQUE OR ACCESS TRADE/EDUCATION ENQUIRIES WELCOME
MICROBOSS LTD 3 HADLEIGH RD FRINTON ESSEX CO13 9HG TEL(0255)671095

CommuniTel

PROFESSIONAL VIEWDATA SYSTEM

CommuniTel is an exciting professional viewdata system for the BBC B, Master & Compact Micros (DFS, ADFS or Network).

IT'S USES IN EDUCATION INCLUDE

Learning Information Technology Cross-Curricular Development
Structuring Creative Learning Administration/Publicity

The system includes a comprehensive suite of programs which enables the creation of a database with message facilities. This can then be made available to callers using a telephone line and any viewdata terminal. The package includes comprehensive tutorial and reference manuals and a sample database.

Available in TWO LEVELS FOR USE WITH THE DTI (DaCom or Tandata) SCHOOLS MODEM

LEVEL 1+

FRAME EDITOR
SEARCH
CAROUSEL DISPLAY
FRAME PRINTER
VIEWDATA - TERMINAL

LEVEL 1 - £55

UPGRADE FROM LEVEL 1+ TO LEVEL 2 £45

LEVEL 2

FRAME EDITOR
SEARCH
CAROUSEL DISPLAY
FRAME PRINTER
VIEWDATA - TERMINAL
DIAL IN HOST SYSTEM
TELESOFTWARE FORMATTER

LEVEL 2 £95

UPGRADE FROM LEVEL 2 TO ADFS LEVEL 2 £45

LEVEL 2 with Auto-answer/Auto-dial MODEM from £375 (all prices exclude p&p & VAT)

The ADFS version includes response frames and gives up to 500 pages with a single 80 track D.S. disk or thousands of pages using a winchester disc drive.

ALSO FOR NIMBUS L1, L2 AND ARC L1

FOR A DEMONSTRATION OF LEVEL 2 dial:

Viewdata No 025 125 2923 or Telephone: 025 125 5137

For more information cut out the coupon and send to:

COMMUNITEL, THE MALT HOUSE, FARM OFFICE, FRENESHAM, SURREY GU10 3EH

Please send me details of CommuniTel products. I am particularly interested in (please indicate)

NAME

POSITION

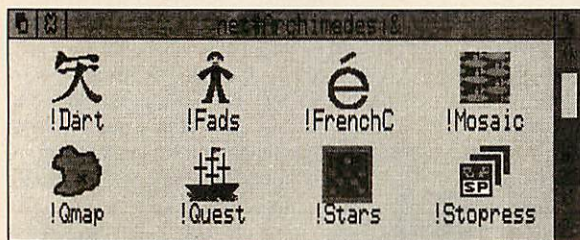
ESTABLISHMENT

ADDRESS

TEL

AU5

Educational Software for Archimedes



The best-selling BBC Micro software from the Advisory Unit has now been made available for the Archimedes and A3000. The software has been converted to run in native mode, not under emulation, yet every effort has been taken to ensure that they remain as faithful as possible to the BBC versions.

The titles now available for Archimedes are: Stopress £30, Qmap £30, Mosaic £25, Fads £25, Dart £15, Stars £12, Hex £12. A greatly enhanced version of Quest, offering many new features over the BBC Micro version is also available at £30.

To order or for more information, contact:

Advisory Unit for Microtechnology in Education,
Endymion Road,
Hatfield,
Herts.
AL10 8AU
Tel. 0707 265443
Fax. 0707 273651
BT Gold 87:CBL001



THIS MONTH ONLY!

All Archimedes A3000
machines will include free
1MB RAM expansion

All 400 series machines
include free 1MB RAM
upgrade plus £50 off the
peripheral of your choice

	BASIC	MONO	COL.	MSCAN
A3000	645.00	739.00	849.00*	1,100.00
A410/I	1,199.00	1,204.00	1,333.00*	1,563.00
A420/I	1,699.00	1,759.00	1,888.00*	2,118.00
A440/I	2,499.00	2,559.00	2,688.00*	2,918.00

* Add £20.00 for Phillips CM8833 monitor

A3000 Upgrades

1MB A3000 memory upgrade, runs many applications more efficiently. A quality board, simple and easy to fit £140.00
3.5" External drive £85.00
Serial upgrade £19.00
A3000 User/MIDI port £49.00

400 Series Upgrades

20MB Hard disc 209.00
40MB Hard disc 334.00
50MB Hard disc 525.00
410 upgrade TO 2 or 4 MB
(ie. add 1 or 3 MB @ £90/MB) £90.00 or £270.00
420 upgrade TO 4MB only (ie. add 3MB) £270.00

SOFTWARE

IMPRESSION NOW AVAILABLE!!!

Simply the best and most powerful package currently available for the Archimedes. Not strictly a W/P or a DTP, more a document processor. Packed with advanced features. Write or phone for detailed brochure. £139.00

DTP

ACORN DTP £125.00
TEMPEST DTP £113.00
HAND SCANNER AND SOFTWARE £180.00
A4 SCANNER AND SOFTWARE £440.00
SPREADSHEET
PIPEDREAM V.3 £140.00
SIGMASHEET £57.00

DATABASES (*requires SYSTEM DELTA PLUS)

MULTISTORE	£250.00
SYSTEM DELTA+ V.2	£65.00
GAMMAPLOT	£60.00
*REPORTER	£34.00
*MAILSHOT	£34.00
GAMES	
E-TYPE, ROAD RACER	£16.00
HOLED OUT, GOLF	£16.00
ARCADE SOCCER	£16.00
U.I.M.	£25.00
THE OLYMPICS	£16.00
INTERDICTION, FLIGHT SIMULATOR	£30.00

MIDI ON THE ARC

EMR STUDIO 24 PLUS, V.2

An advanced MIDI recording sequencer for the 310 and 400 series computer. Designed for home, school and semi-professional studio within a 24-track environment. Extensive on-screen HELP and individual track Music Score makes this ideal for educational applications. Cue list, Undo, etc. Many features added to original V.1, eg. SMPTE facility, Drum, Event, Graphic and Score edit. Includes Utilities disc containing example files. £143.00

ARMADEUS SOUND SAMPLING

Full-featured RISC OS multi-tasking application. Real time wave-form image display, sample editing (cut, reverse, echo, fade in/out, re-scale, looping etc), 128-point real time spectrum analysis, replay stereo effect, play samples via MIDI keyboard, sample up to 114 seconds on 1MB RAM, variable sample rate from 4KHz-76KHz, compatible with Armadeus sampler board, Armadillo A448, A448b (mono version), Wildvision ADC 1208, Unilab interface. Software £69.00
Software + Sampler board £175.00

ARMADILLO SOUND SAMPLING

16-bit stereo including MIDI ports. Modular software construction (Voice set-up, Sampler, Object Manager, etc), powerful editing facilities (looping, delete, copy, move, insert, zero, reverse, fade-in/out, envelope shaping), replay via MIDI keyboard, sample mapping across keyboard, etc. Many more advanced, sophisticated and powerful features. £616B 16-bit sampler inc. MIDI ports £1,250.00

INSPIRATION MIDI SEQUENCER

A feature-packed MIDI sequencer for the Archimedes. Multi-tasking, interactive windows, colour display, etc. Many advanced features. Available soon! £399.00

=AMPSOUND=

153a Victoria Street, St Albans Herts., AL1 3TA
Telephone 0727 50075 Facsimile 0727 58977
ALL PRICES EXCLUDE VAT, P&P

Business Software

EXTENDED PAYROLL has been in use by Acorn/BBC users for 8 years. Your chance to start the new tax year right with the program used by a large number of companies throughout the U.K.

Up to 400 employees can have their weekly, fortnightly, four weekly or monthly pay processed for any tax or National Insurance code whether contracted in or out. We allow for three flexible overtime rates, automatic basic pay or an hourly rate as well as SSP, SMP, holiday pay, flexible pre-tax and post-tax pay for bonuses, Union dues etc and also a personal pension scheme deduction. Unlike any other program we also offer the choice of printing out to screen only or a choice of plain paper or our professional twin NCR pre-printed wage slips. If you are sceptical that at just £49.95 + VAT this program will really do all you need we can always increase the price! Send for further information and see.

ACCOUNTS programs are a pain in the neck because none of them do all that you need and take ages to learn! Who says so - we say so.

We wrote our first cashbook program back in 1978 for a charity and it is still the basis for our four accounts programs to this day. Why? Well because it worked then and it works now. The principle that is. There have been a few changes here and there since then. CASHBOOK at £13.74 is ideal for home and clubs, the £22.94 version CASHBOOK is disc based and very well suited to schools and non VAT registered businesses. Imagine in a school being able to list out all the income from any outings you organise down to individual payments! ACCOUNT at £34.44 is designed for those who offer credit in a small way and the big boys need the top £57.44 package called ACCOUNT-PLUS. This has all the benefits of the others plus automated statements, a mailing program and invoice/credit/quotations etc. For those who like to do their own balance sheets and know what the tax inspector will charge we offer TAXMAN at £57.44. If you know what you owe you can be sure to save.

MAILING programs come in two styles, simple at £13.74 and all singing all dancing at £34.44

GEANEALOGY SOFTWARE FOR GENERAL GENEALOGISTS WITH PROPER TREE PRINTOUTS £19.95

10 3.5" discs £8.00; 10 5.25" discs £4.49; 2000 sheets fanfold listing paper £15.35

Micro-Aid

Prices includes VAT but please add 69p for postage.
Kildonan Courtyard, Barrhill, GIRVAN, Ayrshire, KA26 0PS
Telephone Colin on 0165-82288 for further assistance.

Data Store Software presents...

!FONTEX

Font Manipulation Software

for Archimedes and A3000 Microcomputers.

Creates !Draw files for import into DTP, Pipedream3, Genesis etc.

CIRCLE ROTATION
EFFECTS JIGGLE
TEXT AROUND AN ARC
SHADOWS

...plus many other effects.

Only £9.95 (+50p p&p) from THE DATA STORE
6 CHATTERTON ROAD, BROMLEY, KENT

Tel. 081-460 8991 Fax. 081-313 0400

(Requires Acorn Outline Font Manager as supplied with most DTP packages)

hyperbook

Imagine a book that can guide you through its own pages. A book that will take the time to stop and explain words you don't understand. A book that allows you to explore its information through many different pathways, and forge your own if you care to go off the beaten track.

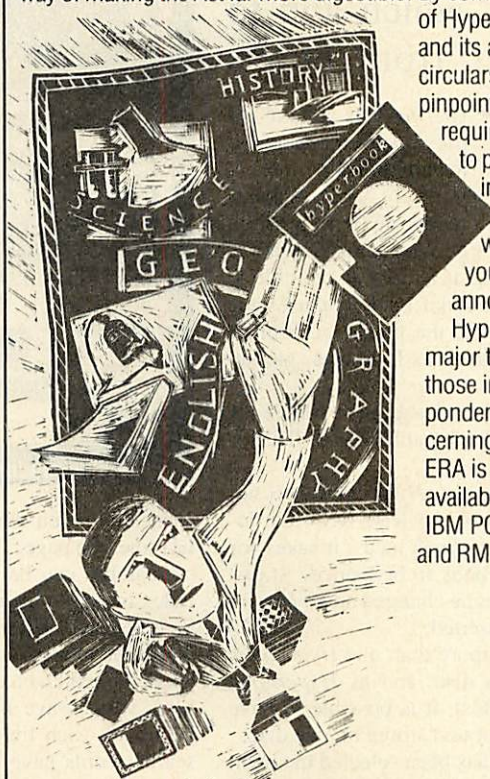
Such a book exists. Hyperbook Reader software and texts from Longman Logotron enable you to read, search, edit and source material from a growing collection of comprehensive computer-based study texts.

Pathways to Knowledge

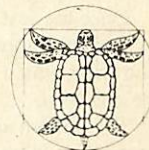
Hyperbook and the ERA

The Education Reform Act affects the whole educational community. Teachers, governors, administrators, children and their parents are already taking the strain. To help you analyse the impact of the ERA on your teaching practice, Longman Logotron have found a simple way of making the Act far more digestible. By combining the versatility

of Hyperbook with the ERA and its associated DES circulars, it is possible to pinpoint the clauses you require quickly and easily, to paste extracts directly into word processed documents, as well as adding your comments and annotations to the text. Hyperbook ERA is a major time-saver for all those involved with correspondence and reports concerning the Act. Hyperbook ERA is a stand-alone text available on 3.5" disks for IBM PC, Acorn Archimedes and RM Nimbus computers.



The Hyperbook Reader is also available for £49 and supports a range of texts. For further information about our Hyperbook software range, please contact:
Longman Logotron Ltd, Freepost,
62 Hallfield Road,
Laythorpe, York, YO1 1TJ



**LONGMAN
LOGOTRON**

Please send me _____ copies of Hyperbook ERA for _____ (machine type) @ £25 (inc. p & p). I enclose a cheque/school order (delete where applicable). Cheques payable to Longman Logotron Ltd or tel: (0904) 425444 for credit card orders.

Name _____

Address _____

Postcode _____

TURNING A NEW LEAF

As the paperless office finds itself struggling to become a reality, **MARTIN PHILLIPS** uncovers two programs which aim to take over from books

Hyperbook is a text retrieval system, designed to help users do more effectively what they already do with printed books. It aims to retain a layout and feeling as similar as possible to that of a conventional book but uses the computer to extend the power of familiar literary devices such as footnotes, glossaries and indexes.

Versions of *Hyperbook* are available for the IBM PCs and compatibles as well as for the Arc.

On the Archimedes, *Hyperbook* does not make much use of the Risc OS environment. When *Hyperbook* loads, it asks for the name of the book to be loaded. At this point the disc can be changed and a *Hyperbook* text disc inserted.

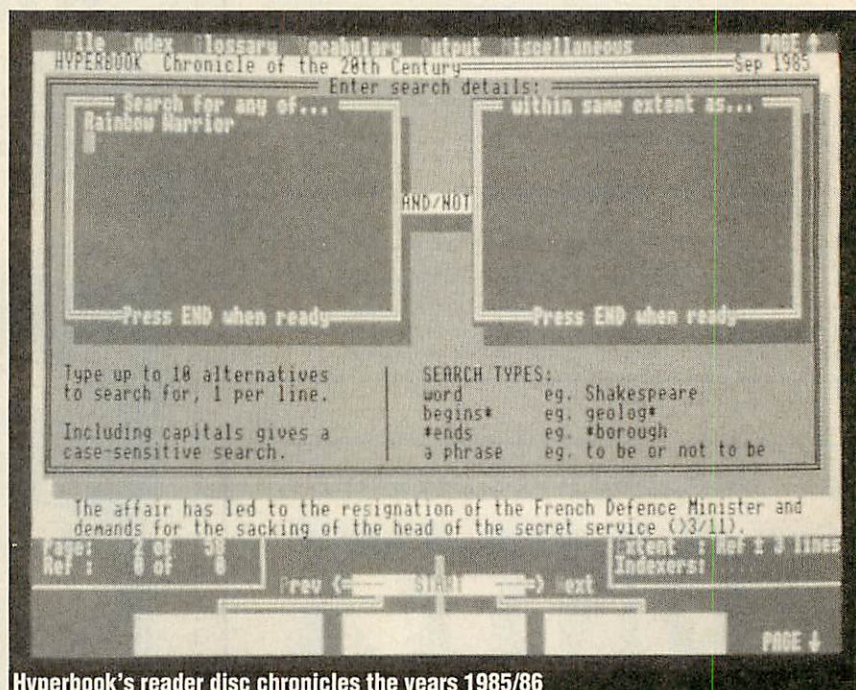
There can be more than one *Hyperbook* text on a single disc, and as *Hyperbook* compresses the text, it is possible to have over 100 pages of text stored on one disc.

Once the text has been selected the main screen will appear with a menu bar at the top from which pull-down menus can then be obtained.

The bottom six lines of the screen form a map area which gives details of the current index, page numbers and other related information. Pages can be viewed directly using the arrow keys or the mouse and are presented as actual pages although only part can be displayed on the screen at once.

While moving the mouse up or down allows the whole page to be scrolled, it is not possible to scroll from one page to another. It is necessary to select the next or previous page.

Although this aims to preserve the feel of an ordinary book, I found it limiting,



Hyperbook's reader disc chronicles the years 1985/86

especially when the reference was on the last line of a page.

Searches can be made by going to the index option in the menu bar and selecting a new search. Up to 10 alternative search words or phrases can be entered. Underneath the search box there are some helpful hints which save having to resort to the handbook each time it is used. Once the search words have been entered, pressing the COPY (END) key moves on to the next option. This selects either a simple search, or one using the operators AND or BUT NOT.

The program takes surprisingly little time to search the text, so you can quickly move to any references found. A particularly elegant touch is the way it treats capitals.

This is always a problem with databases (which is basically what *Hyperbook* is). If the entry is in lower case, then capitals are ignored, and the program will find all entries irrespective of the use of capitals. If, however, capitals are used in the search word then the search is case dependant.

With such a neat solution it is a shame that *Hyperbook* does not automatically switch off the caps lock at this point.

Hyperbook does make searching a text an exciting experience. Once a search has been started, it is possible to start another search and then return to the previous one. It is possible to build up glossaries. Definitions can be entered for selected words and then saved. Notes and comments can be made while browsing. A note is (literally) displayed in the margin to indicate a comment has been made. Highlighting the note symbol displays the comment. As with the glossary, notes can be saved.

The vocabulary function can be used to examine a given range of pages and list each distinct word found within. The vocabulary can be set to ignore 'trivial words' – which are held in a separate file and can be changed by the user.

An important aspect of the program is its ability to send data to a printer or to a disc as a straight text file which can then be loaded into a wordprocessor. When a reference is found in *Hyperbook* it is linked to a single line of text. When printing out, the program normally prints the three lines either side of the reference as well as the actual line. This extent can be changed to

whatever size is required. This is perhaps the only real limitation of *Hyperbook*, I would have liked to be able to link the extent to whole sentences.

Of course, *Hyperbook* is virtually useless without some pre-prepared texts. Longman Logotron is developing a range of such texts. At the moment there are 15 discs available – 13 as separate files, a demonstration green disc and the text file included with the *Hyperbook* reader. The green disc costs £5 and contains newspaper extracts on a range of environmental issues. Sample notes, glossaries and indexes are also provided on this disc.

The *Hyperbook* reader disc, which is the main program disc for the package, contains a 58 page extract from the *Chronicle of the 20th Century* covering the years 1985/6. There are two full discs covering science and technology issues from 1988. Again these are in the form of extracts and articles from newspapers and magazines. Similarly there are two discs on geography and two on economics.

There is even a *Hyperbook* edition of *Hamlet*, presented on screen in the same way as the conventional printed text. Notes are included in the text and these can be amended or extended. There are texts on the Educational Reform Act, The Gospels, *Pride and Prejudice*, The French Revolution, *The 20th Century History Source Book* and a Pollution File.

Longman Logotron has also published a *Hyperbook* authoring system. While this will not appeal to the majority of users (would you fancy typing in the whole of *Hamlet*?) it does extend the versatility of the system.

Encoding can be done from a number of wordprocessors, including *First Word Plus*. For each wordprocessor, the instructions are detailed and easy to follow.

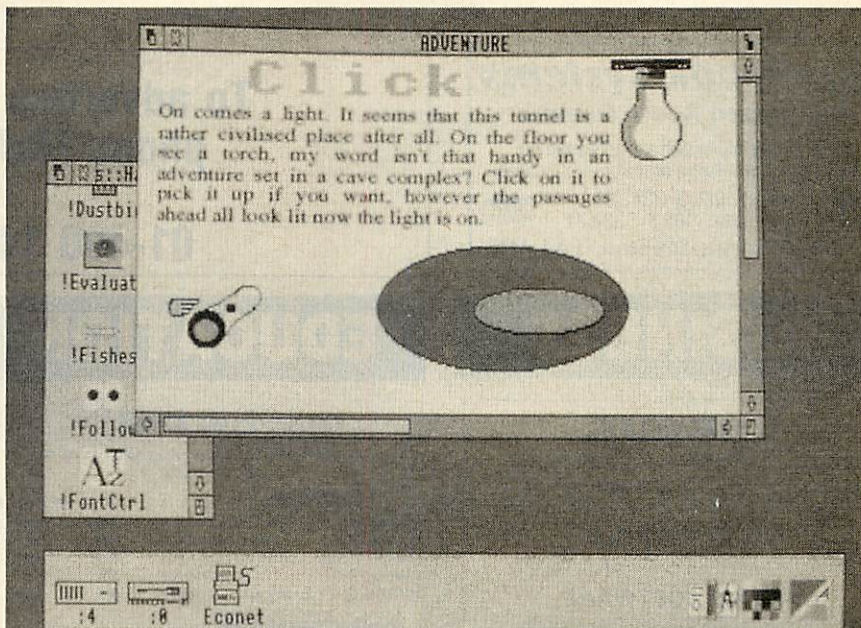
Hyperbook is an exciting program which provides easy access to a range of current information and classics. While the program is clearly aimed at the education market it will have a far wider appeal. The price of each text file is such that it will provide a most cost effective resource. The program is easy to use, the documentation is readable and comprehensive. Longman Logotron has scored a certain hit.

Bookbinder

Bookbinder is an application for the Archimedes that enables books to be built up from individual pages containing drawn objects, bit-mapped images (called sprites) and text.

Bookbinder is similar to some of the adventure books published in the last few years which give a series of options at the end of each page and, by turning to a directed point in the book, the story then continues on the basis of that decision.

A book is built up by creating each page



Hyperbook: An exciting and easy-to-use package

using *!Draw*. The page can contain both text and graphics. When designing each page, there needs to be one or more object bounding boxes that can be selected to go on to another page. It is possible to use the rest of the screen as one of the boxes. Up to five links can be attached to each page, and there can be 200 pages in each book. It is possible to call up the same page through several different routes. This can save a considerable amount of time when creating pages. Once all the pages have been created they are assembled together and the links put in place.

Although this sounds quite difficult, the handbook assures the reader it is 'mind-bogglingly simple'. With one minor problem, it actually is.

First the book reading application supplied on the *Bookbinder* disc is copied and given a new name. Next all the pages previously created are copied into the new book. Then a special window is opened with a start and an end box. The pages of the book are dragged into this window, where they appear as rectangular blocks with their filenames printed inside. These blocks can be positioned as required be-

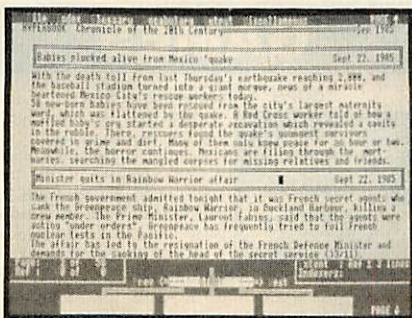
tween the start and end marks. The links are then inserted by calling up an option from the menu. It was quite difficult to get the link fixed to the next page until I realised which part of the special pointer symbol should be inside the new page box.

From then on it is downhill. Links can be added, altered and deleted. Also the positions of the boxes could be adjusted until the layout of the planner looked right. To finish the book off, a new icon can be created for the book and it is ready to be used.

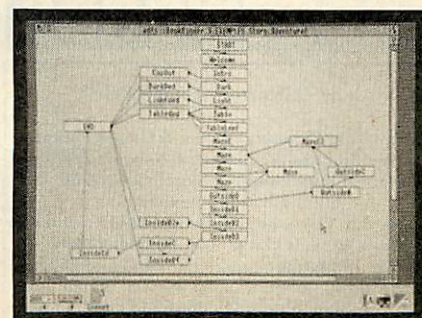
Bookbinder is an interesting program. It could find a niche in the education market where it would be a more versatile form of the BBC teletext programs. It is easy to use, well documented and has a wide range of applications from adventure generators to interactive tutorials.

The *Hyperbook* reader disc costs £56.35 and most texts are available for £17.25 each from Longman Logotron, Dales Brewery, Gwydir Street, Cambridge CB1 2LJ. Tel: (0223) 323656.

Bookbinder costs £55 from Musbury Consultants, 8 Fairhill, Helmshore, Rossendale BB4 4JX. Tel: (0706) 216701.



Bookbinder: Adventure in book creation



Bookbinder: A useful educational tool

SOFTWARE SHOWCASE

sharbrook systems

Authorised Acorn Dealers

For up to date information and prices see our complete range of software on the on-line database



Voice: 0823 334383

Data Line: 0823 333471



18 The Crescent, Taunton, TA1 4EB

To advertise in this section
phone **Matthew Thistle**
on
01-490 1444 ext 1594

BUSINESS

CHEQUE

A unique set of Wordwise - plus segment programs designed to facilitate the generation, printing & analysis of cheques for the small business or club.

£24.95 inc p & p

Send SAE for details and sample printouts to:

CARIOUS SOFTWARE,

54A Moor Crescent, Cosforth, Newcastle-upon-Tyne, NE3 4AQ.

Tel. (091) 2850097

"Most impressive", *Acorn User*, March 1990

"Difficult to fault", *A & B*, February 1990

EDUCATION

DIXON & DIXON

35 ROKEBY DRIVE KENTON NEWCASTLE UPON TYNE NE3 4JY
TEL 091 2853042

FARMING

		ARC	BBC/MASTER
FARMCASH	-ACCOUNTS / STOCK	£200	£100
FIELDFILE	-FIELD DATABASE	£150	£ 75
FARMPLANNER	-FORWARD PLANNING	£180	£ 90
CAPCOST	-INVESTMENT	N/A	£ 50
MILKFILE	-DAIRY MANAGEMENT	N/A	£200

ROUND-DELIVERY

MILKMAN	- MANAGEMENT	£400	N/A
NEWSMAN	- MANAGEMENT	£400	N/A
Complete Systems from £1500		UK please add 15% VAT	

MUSICAL

PANDA DISCS

- ★ Music 5000 discs volumes 1-14 including volume 13 Jean Michel Jarre special
- ★ Music 500 discs volumes 1-3
- ★ Island Logic TMS music data files volumes 1-3
- ★ All music discs £5 (after June 1st £6)

CROSSWORD PUZZLE COMPILER FOR BBC MICROS
Wimp-style program with dictionary, sample files and comprehensive manual. Very easy to use. £14.95



All prices include postage + package in UK
Further information by SAE
PANDA DISC, Four Seasons Tinker Lane,
Brewood, Stafford, ST19 9DE

CORPLAN

Extends Wordwise-Plus or -Plus II into a complete word processing system, with descriptive document indexes, address files and library of up to 22 user-defined document formats. Links to Inter-Word also.

Simplifies use of 40 column screen by auto-writing of data to forms. Layouts are accurately reproduced, everytime, without skill.

Integrated utilities include a mailmerge printer with pick-and-print facility - ideal for busy people at work and at home.

Thoroughly proved in a demanding office environment.

Runs in B, B+, B+128, Master 128 and Compact. Supports Acorn DFS, Watford, Opus DDOS (3.46) and ADFS. With DDOS or ADFS, twin drives are not essential. Can use all available drives to advantage.

Supplied on disc, with manual and keypad. Price £19.50, post free UK, by cheque/PO. 14 day unconditional refund.

For full details please send large SAE.

C W Robertson, Three Gables, 7A Talbots Drive, Maidenhead, Berks, SL6 4LZ

NORTHERN MICROMEDIA

Northern Micromedia is the publishing arm of NORICC, a regional IT Teachers Centre. We produce a wide range of stimulating educational software for children aged 5-16 and many titles are accompanied by useful support material.

Please write or telephone for a free catalogue to:

NMM, Resource Centre, Coach Lane Campus, Coach Lane,
Newcastle-upon-Tyne NE7 7XA

Tel: 091 270 0424

Micro Librarian SYSTEMS

... circulation control and catalogue interrogation software for libraries.

No more worrying about overdue books or statistics for the librarian. No more thumbing through cards or browsing shelves for the borrower.

From specialist Primary and High School solutions to the unlimited facilities, instant response and network capabilities of the 'Professional'.

Staley Cottage, Ridge End Fold, Marple, Stockport, Cheshire SK6 7EX (Tel: 061-449 9357)

PROGRAMS FOR MUSIC PUPILS PLAY WHAT I PLAY

(improve your ear and enjoy it)

THEORY OF MUSIC Questions and Exercises

(Grade 2-5 - unlimited practice)

GRADE 1 THEORY OF MUSIC

(Tutorial - from the beginning)

Each: B/Master £13.50, Compact/Arc £14.50

Full details from TED KIRK (0744 818761)

33 Humber Crescent, St. Helens, Merseyside WA9 4HD

IMPORTANT

THE SOFTWARE SHOWCASE IS FOR YOU THE

smaller software producer
special benefits include

- ★ Low rates and series discounts
- ★ High visibility
- ★ Free typesetting
- ★ Your own categoric heading

If you have some interesting software to promote and don't want it lost among the larger advertisements then call now on (01) 490 1444 (Ext 1594) for the most cost effective advertising available.

CROSSWORDS

Akom Ltd present AKROSS

The definitive Crossword Editor & Games Package
For **Archimedes** & **A3000** (inc. Network licence)

Normal price **£68.50** Schools Price **£58.50**

ALSO the widely acclaimed

Times & Sun Computer Crosswords (13 volumes)

Times Volumes **£19.95** Sun Volumes **£18.95**

Also for **RM Nimbus** and other BBC models for

further details and mail order contact.. Akom Ltd,

51 Manor Lane, London SE13 6QW

Tel: 01-852 4575 (Prices inc. VAT, P&P UK,

add £2 surcharge orders ex UK)

GAMES

"COPS" - An Interactive Story



"COPS" is an absorbing and amusing adventure with graphics. Unique mouse input system to pick words from the screen or pre-defined icons. Hundreds of locations, advanced parser and lots of objects.

All versions are disk only.

Archimedes £19.95, **BBC/Electron** (text only) £13.95
(Compact or Electron 3.5" ADFS disks: £14.95)

Adventure Creator: **Archimedes** £33, **BBC** £28.95

ALPINE SOFTWARE, Telephone 0762 342510

PO BOX 25, Portadown, CRAIGAVON, BT63 5UT

Weather Data

Weather Satellite Systems Now available for the Acorn Archimedes A310 and A3000. This Meteosat systems comes complete including everything from the Antenna to the software. Animation is standard allowing the dynamic progress of weather fronts to be monitored and tracked. High resolution images of 800 pixels by 800 lines can be stored and manipulated in colour or grey scales on any standard colour monitor. Acorn Change FSI registered and compatible. Capable of receiving up to 400 images every day this remarkable system costs just £599.00

Weather Satellite Resource Pack This 190 page photocopyable resource is full of drawings, charts, photographs and activities. Written by James Hinderson, Humanities Advisor for the Field Studies Council, this resource is a must for any weather satellites user at only £34.95

Weather Forecaster An amazing software package that actually learns and adapts to your precise location. Simply tell it barometric pressure, temperature and estimated cloud cover, it will then give you an accurate 24 hour local forecast! Based on a self teaching expert system neural network, it will run on the Acorn Archimedes with the PC emulator. Weather Forecaster is available for £59.95

Other Timestep products include a fully featured LANDSAT Image Processor with 20 field study images and three full colour manuals. Acorn Change FSI registered and compatible at only £99.95

PC Globe and PC USA are full colour graphical databases of the world with an amazing amount of retrievable data. The special Timestep education price is only £59.95

Send for our full catalogue.

Timestep Weather Systems
Wickhambrook Newmarket
CB8 8QA England
Tel: 0440 820040 Fax: 0440 820281

INVEST WITH PRO-PUNTER

PRO-PUNTER is an extremely powerful analytical program for horse racing that can produce over 50% winners from top-rated selections and over 70% winners from recommended bets ("Investment Advices").

But don't just take our word for it: take that of the "Racing Post" – "the results were impressive...Pro-Punter is the best (racing software) available." (Racing Post, 13th Feb. 1990) – or take the similar conclusions of many other reviewers since 1987. Better still, take the evidence of our proofing to the racing press during 1987-88 and recently re-started to coincide with the launch of the second edition of PRO-PUNTER on the BBC and IBM PC computers: forecasts for 15 top-class races proofed to the press over four Saturdays producing 7 top-rated winners and including 4 winners from 5 Investment Advices.

PRO-PUNTER produces a forecast finishing order, a numerical rating for each horse and expresses the probability of each horse winning as odds. Designed as an "expert system" for novice and expert alike, it tells you when to bet or if not, why not. There is an optional form database but there is no day-to-day updating involved: use PRO-PUNTER as and when you like.

Interested? Send for our free information pack containing details/results/reviews or telephone 061-330 0184. PRO-PUNTER is available for the BBC B/MASTER 128 (DFS) and IBM PC compatibles at £62.50 inc. VAT p&p. Also available for the ATARI ST, AMSTRAD PCW, and CPC 6128 at £57.50 incl. We accept Access and Visa. Full after-sales support.



"Technology to beat the bookie."
 (Raceform Handicap Book)

DGA SOFTWARE, PO BOX 36,
ASHTON-UNDER-LYNE, LANCS.
OL7 9AJ
TEL: 061 330 0184



DGA Software trades from Barnfield House, Kings Road, Ashton-under-Lyne. All correspondence please to PO Box.

ACORN USER ADVERTISEMENT PAGES - MAY 1990

4- Mation	126	Computer Concepts	70	Home Based Business	116	Norwich Computer Services	41
Advisory Unit for		Computer Depot	116				
Microtechnology		Computerware	16	Ian Copestake Software	115	Orion Computers	117
in Education	130	Contex Computing	56	IFEL	22	Overseas Media Distribution	1
AJL Electronics	87	Craddock Computers	62	Impact Posters	74		
Alsystems	116	CSS	84	Inspiring Software	126	Pineapple Software	12
Ampsound	130	Cue Video	32	Integrex	63	Portobello Trading Company	18,41
Apricote Studios	62			Intelligent Interfaces	84	PRES	4,5
Automatic Services	82	Dabhand Computing	85	Irlam Instruments	IFC		
		Dabs Press	88			Sabre Computers	32
B & S Computing	13	Dataplex	126	Kendal Computer Centre	101	SGB Computer Services	126
BBD Computer Dust Covers	101	DGA Software	135			Silicon Vision	19
Beebug	6,8,11,21,60	Diamond Computing	122	Logotron Ltd	131	Simtron	101
		Digithurst	116			Software Bargains	33
Calderglen Computers	118			Main Media	12	Software Solutions	14
Cannon Computing	56	Electromusic Research	87	Manor Court Supplies	104	Star Devices	82
Care Electronics	25			Mayhew Telonics	104	Superior Software	BC
Caspell Computer Services	82	Fact Systems	84	MD Office Supplies	76	Swift Software	102,103
Circle Software	61	Fairhurst Computer	62	Meadow Computers	41		
CJE Micros	24			MEWsoft	82	Terrell Electronics	126
Clares	57,72	GMA	101	Micro Studio	12	Timestep Weather Systems	135
Colton Software	2	Ground Control	22	Microsnips	40	Tobin Music	101
CommuniTel	130			Minerva Software	IBC	Wild Vision	87
Computeck	68	HCCS Associates	86	Mydisk	62	Willow Software	56



When Brian Kerr was working as a producer for Thames Television in 1983, a videotape of an American game show arrived on his desk. The show – a huge success in the US – displayed 30 monitors from which contestants selected their prizes.

There, the monitors were controlled by a series of Commodore computers and Brian's task was to devise a suitable system for a British version of the programme – *Strike It Lucky*. Rather than pick identical machines, Brian chose a network of BBC Masters and wrote his own accompanying software. 'I'd been a fan of the BBC micro since it first came out,' he says. 'So I analysed what was required and came up with a system using a network of Masters and one controlling computer. I set up a bank of eight computers feeding graphic information through to a video switcher matrix'.

After a few minor 'teething' problems, the technical side of rehearsals went well. Michael Barrymore was called in to present the show and the audiences loved it! The British version of *Strike It Lucky* had struck gold!

Several years later, the popular game show is still going strong. 118 episodes have been made so far and, with no less than 14 million viewers, it ranks highly in the nation's top 20 favourite programmes.

Throughout its successful run, the network of Masters have remained intact. Contestants call up their prize on the appropriate monitor before Michael can even think of shouting 'Awright'!

Brian explains how the system works: 'All 30 monitor screens you see on the show are fed back to the video matrix. Coming into the video matrix are signals from eight Master computers all connected by an Econet cable to the controlling computer which is a Master 128. This Master

The Master is star of stage and 30 TV screens.

CHRISTINA NEAL investigates



LUCKY STRIKE

has an RS232 link to the video matrix so when contestants ask for four moves, the first four computers will be loaded with a prize or a hot spot, selected by the computer'.

Commands are sent down the Econet cable when the details on the monitors need altering. A signal from the video matrix sets off a sequence of yellow flashing stars. Another signal changes the colour of the lettering on the monitors in order to display the prizes. 'The prizes are already written on those blue monitor screens but they are written in blue so you can't see what they are until the contestant hits the button and the signal for a change of colour alters the lettering to white'.

It all sounds fairly simple but writing the software to run the system was a lengthy task. Although he had been using a BBC micro for personal use at home, Brian ad-

mits he spent countless hours developing it to work with his unique setup.

'From the American video I had to break down exactly what the sequence of the operations was in terms of what appears on the screens at certain times. From that I was able to work out what I could manage with a network of eight machines'.

'Contestants are allowed to ask for two, three or four questions at the most. So I broke down the various graphics into modules and then devised a controlling program to run it all together'.

The result was a system which even the zany Mr Barrymore has no qualms about.

'Michael can operate the system and has done so during rehearsals. He's quite good at it too. We're fortunate to have him present the show because he knows how to handle the computers. When he's filming, things get very exciting and the staff in the gallery are literally cheering people on.

'You might have a nice old couple who've reached the ninth monitor and if they reach one more, they'll win £3000. But we're powerless to do anything about it'.

The future of the programme looks equally promising. Another series is planned for 1991 and Brian is hoping to replace the network of Masters with the speed and sophistication of the A3000.

'The A3000 looks an overall faster and more powerful machine. The technical departments here also use a Master network, so we're hoping to replace them with the new machine too'.

Until then, *Strike It Lucky* looks set to gain even more popularity. Brian's shrewd network and Michael's warm humour combine with a fun range of prizes which never fail to amuse the contestants.

'People do win holidays and trips on Concorde but we like giving away slightly unusual prizes like camping equipment and garden gnomes', laughs Brian. 'We'll keep putting them in too because it's more fun – making people laugh is the whole idea'.

YOU TALKED
WE LISTENED
NOW IT'S HERE!

MULTISTORE

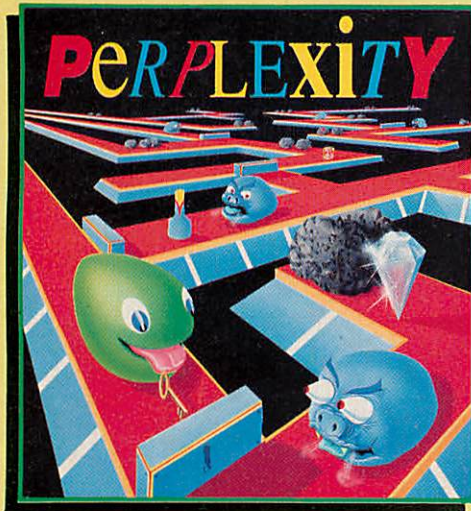
THE · DATABASE · OF · THE · FUTURE

£299 + VAT



COMPUTER SOFTWARE AND SYSTEMS SPECIALISTS
69 SIDWELL STREET · EXETER · EX4 6PH · TEL: (0392) 437756 · FAX: (0392) 421762

THREE GREAT NEW TITLES FROM SUPERIOR SOFTWARE



PERPLEXITY

3-Dimensional Strategy Game with Brilliant Graphics

PERPLEXITY consists of 16 increasingly difficult levels, each a puzzling maze with one of four different 3D background themes. Collect the diamonds by pushing together the boulders scattered about the maze and push the keys to the correct doors to open them.

But watch out for the monsters who will chase you around the maze. And watch out also for the 'mystery boulders', which may give you a bonus score or a magic potion, but may also reverse some or all of the movement controls...then you've really got problems!

On-screen information includes a constantly up-dating scanner/map, which allows you to plan your route, a score-line and timer/status icons. Passwords allow you to skip completed levels.

PERPLEXITY combines the best puzzling features of REPTON games with superb 3D graphics, to give a highly addictive and visually brilliant game. Are you ready to face the challenge?

(The Electron version has the same graphics as the BBC Micro version.)

PLAY IT AGAIN SAM 13 A New Top-Hit Four-Game Compilation

BARBARIAN II

Have you the skill and strategy to reach the Dungeon of Drax? Twenty gruesome monsters to defeat in an 80 screen maze.

"The monsters are spectacular in size and design. A most impressive and playable game"....Acorn User

PERCY PENGUIN

The classic and highly addictive game by Superior. Percy must kill the Snobees in the frozen maze by hurling ice cubes at them, but deadlier breeds then appear!

"Enjoyable to play with good graphics and sound"....A & B Computing

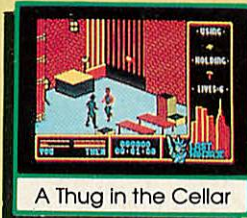
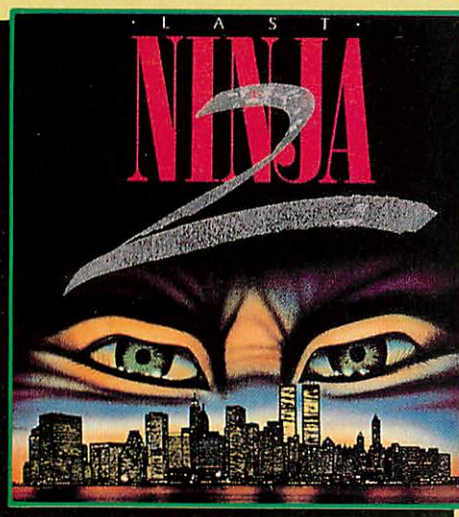
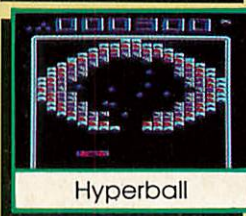
HYPERBALL

A brand-new release by Superior. The best version ever of the classic 'bat-and-ball' game, with 6 levels and a massive total of 120 screens. Special features include: infra-red scanners, 8-ball splitters, aliens, cannons, weapons' purchase, bonus rounds and screen-jump options.

PANDEMONIUM

A brilliant 'Top Ten' game by Peter Scott, featuring teleporters, lifts, springs, weird aliens to shoot, and lots, lots more, as you attempt to construct the core.

"Eighty screens of fun make this game my favourite"....Micro User



LAST NINJA 2 - Back with a Vengeance!

Born in a time of peace, lived in a time of war; the shadow warrior returns. Leaping the abyss of time he comes to fulfil his destiny!

DATELINE: 1990 **THE PLACE:** Downtown New York
THE QUEST: To destroy the eternal evil.....Kunitoki!

Lots more fiendish adversaries, more colourful screens with superb graphics, a score-line, a timer... and lots and lots more exciting Ninja action. Are you ready for the thrills and skills of the Ninja in crime-filled Manhattan? Can you survive the six action-packed levels?

You start in the notorious CENTRAL PARK, with thugs, police and bees to get past, and shuriken stars and hamburgers to collect. Now to THE STREET, littered with down-and-outs and meths bottles. Take care in THE SEWERS to avoid the darkness and the crocodile. On to the forbidding opium factory in THE CELLAR and then to THE OFFICE and a secret computer code. Finally to KUNITOKI CASTLE with its immortal adversaries and the trickiest puzzle of all!

BBC Micro Cassette.....£9.95 each BBC Micro 5 1/4" Disc.....£11.95 each
(Compatible with the BBC B, B+ and Master 128 computers.)

BBC Master Compact 3 1/2" Disc.....£14.95 each Electron Cassette.....£9.95 each
(The screen pictures show the BBC Micro versions of the games.)



ACORNSOFT

(Superior Software is a trading name of Superior Microcomputing Ltd.)
Dept. Z2, P.O. Box 6, Brigg, S. Humberside DN20 9NH. Tel: (0652) 58585

Available from
WHSMITH
and all major dealers

PLEASE MAKE CHEQUES
PAYABLE TO "SUPERIOR SOFTWARE."



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE
• All mail orders are despatched by first-class post!
• Postage and packing is free
• Cassettes and discs that are faulty on receipt will be replaced immediately
(This does not affect your statutory rights)